SOIL SURVEY OF

Medina County, Ohio

United States Department of Agriculture
Soil Conservation Service
In cooperation with
Ohio Department of Natural Resources
Division of Lands and Soil
and the
Ohio Agricultural Research and Development Center

This is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and agencies of the States, usually the Agricultural Experiment Stations. In some surveys, other Federal and local agencies also contribute. The Soil Conservation Service has leadership for the Federal part of the National Cooperative Soil Survey. In line with Department of Agriculture policies, benefits of this program are available to all who need the information, regardless of race, color, national origin, sex, religion, marital status, or age.

Major fieldwork for this soil survey was completed in the period 1966–72. Soil names and descriptions were approved in 1974. Unless otherwise indicated, statements in the publication refer to conditions in the county in 1972. This survey was made cooperatively by the Soil Conservation Service; the Ohio Department of Natural Resources, Division of Lands and Soil; and the Ohio Agricultural Research and Development Center. It is part of the technical assistance furnished to the Medina County Soil and Water Conservation District.

This survey was aided by funds provided by the Medina County Commissioners. The soil survey of Brunswick and Hinckley Townships was partly financed by the Tri-County Regional Planning Commission through a grant from the Urban Renewal Administration of the Housing and Home Finance Agency under the Urban Planning Assistance Program authorized by section 701 of the Housing Act of 1954, as amended.

Soil maps in this survey may be copied without permission, but any enlargement of these maps could cause misunderstanding of the detail of mapping and result in erroneous interpretations. Enlarged maps do not show small areas of contrasting soils that could have been shown at a larger mapping scale.

HOW TO USE THIS SOIL SURVEY

THIS SOIL SURVEY contains information that can be applied in managing farms and woodlands; in selecting sites for roads, ponds, buildings, and other structures; and in judging the suitability of tracts of land for farming, industry, and recreation.

Locating Soils

All the soils of Medina County are shown on the detailed map at the back of this publication. This map consists of many sheets made from aerial photographs. Each sheet is numbered to correspond with a number on the Index to Map Sheets.

On each sheet of the detailed map, soil areas are outlined and are identified by symbols. All areas marked with the same symbol are the same kind of soil. The soil symbol is inside the area if there is enough room; otherwise, it is outside and a pointer shows where the symbol belongs.

Finding and Using Information

The "Guide to Mapping Units" can be used to find information. This guide lists all the soils of the county in alphabetic order by map symbol and gives the capability classification of each. It also shows the page where each soil is described and the woodland suitability group in which the soil has been placed.

Individual colored maps showing the relative suitability or degree of limitation of soils for many specific purposes can be developed by using the soil map and the information in the text. Translucent material can be used as an overlay over the soil map and colored to show soils that have the same limitation or suitability. For example, soils that have a slight limitation for a given use can be colored green, those with a moderate limitation can be colored yellow, and those with a severe limitation can be colored red.

Farmers and those who work with farmers can learn about use and management of the soils from the soil descriptions and from the discussions of the capability units and woodland groups.

Foresters and others can refer to the section "Woodland," where the soils of the county are grouped according to their suitability for trees.

Game managers, sportsmen, and others can find information about soils and wildlife in the section "Wildlife."

Community planners and others can read about soil properties that affect the choice of sites for dwellings, industrial buildings, and for recreation areas in the section "Town and Country Development."

Engineers and builders can find, under "Engineering Uses of the Soils," tables that contain test data, estimates of soil properties, and information about soil features that affect engineering practices.

Scientists and others can read about how the soils formed and how they are classified in the section "Formation and Classification of the Soils."

Newcomers in Medina County may be especially interested in the section "General Soil Map," where broad patterns of soils are described. They may also be interested in the information about the county given in the section "General Nature of the County."

Contents

	Page
Index to mapping units	ii
Summary of tables	iii
How this survey was made	1
General soil map	2
Soils that formed in glacial till on uplands	2
1. Ellsworth-Mahoning association	2
2. Mahoning-Ellsworth association	3
3. Canfield-Wooster-Ravenna association	3
4. Rittman-Wadsworth association	3
5. Bennington-Cardington association	4
6. Cardington-Bennington association	4
Soils that formed in lacustrine, alluvial, or glacial outwash deposits on terraces and flood plains and in glacial outwash areas	4
7. Haskins-Caneadea-Lobdell association	4
8. Fitchville-Chili-Bogart association	5
9. Carlisle-Luray-Lorain association	5
Use and management of the soils	6
Crops and pasture	6
General practices of management	6
Capability grouping	6
Management by capability units	7
Estimated yields	14
Special crops	17
Irrigation	17
Woodland	18
Wildlife	19
Elements of habitat and kinds of wildlife	19
Engineering uses of the soils	27
Engineering soil classification systems	27
Engineering test data	28
Soil properties significant in engineering	28
Engineering interpretations of the soils	28
Town and country development	29
Descriptions of the soils	64
Bennington series	65
Berks series	67
Bogart series	68
Canadice series	69
Caneadea series	70
Canfield series	71
Cardington series	73
Carlisle series	74
Chagrin series	75
Chili series	76
Condit series	78
Ellsworth series	79
Fitchville series	81
Geeburg series	83
Glenford series	84
Haskins series	85
Holly series	86
Jimtown series	86
Linwood series	88
Lobdell series	89
Lorain series	89
Loudonville series	90
Luray series	91
Mahoning series	92
Miner series	94
Olmsted series	95
Orrville series	96
Oshtemo series	96
Ravenna series	97
Rawson series	99
Rittman series	99
Schaffenaker series	101
Sebring series	102
Tiro series	103
Wadsworth series	104
Wallkill series	105
Willette series	106
Wooster series	107
Formation and classification of the soils	108
Factors of soil formation	108
Parent material	108
Climate	109
Relief	109
Living organisms	109
Time	109
Processes of soil formation	109
Classification of the soils	110
Laboratory data	112
General nature of the county	113
Climate	113
Physiography, relief, and drainage	113
Farming	113
Literature cited	116
Glossary	116
Guide to mapping units Following	119

Issued November, 1977

Index to Mapping Units

	Page
BnA—Bennington silt loam, 0 to 2 percent slopes	67
BnB—Bennington silt loam, 2 to 6 percent slopes	67
BoA—Bennington-Tiro silt loams, 0 to 2 percent slopes	67
BrF—Berks silt loam, 25 to 70 percent slopes	68
BtA—Bogart loam, 0 to 2 percent slopes	69
BtB—Bogart loam, 2 to 6 percent slopes	69
Ca—Canadice silty clay loam	70
CcA—Caneadea silt loam, 0 to 2 percent slopes	70
CcB—Caneadea silt loam, 2 to 6 percent slopes	71
CdA—Canfield silt loam, 0 to 2 percent slopes	72
CdB—Canfield silt loam, 2 to 6 percent slopes	72
CdB2—Canfield silt loam, 2 to 6 percent slopes, moderately eroded	72
CdC2—Canfield silt loam, 6 to 12 percent slopes, moderately eroded	72
CeC—Canfield-Urban land complex, rolling	72
CfB—Cardington fine sandy loam, 2 to 6 percent slopes	73
CgB—Cardington silt loam, 2 to 6 percent slopes	74
CgC2—Cardington silt loam, 6 to 12 percent slopes, moderately eroded	74
CgE2—Cardington silt loam, 12 to 25 percent slopes, moderately eroded	74
Ch—Carlisle muck	75
Cm—Chagrin silt loam	76
CnA—Chili loam, 0 to 2 percent slopes	76
CnB—Chili loam, 2 to 6 percent slopes	76
CnC—Chili loam, 6 to 12 percent slopes	77
CoC2—Chili gravelly loam, 6 to 12 percent slopes, moderately eroded	77
CoE2—Chili gravelly loam, 12 to 25 percent slopes, moderately eroded	77
CoF2—Chili gravelly loam, 25 to 70 percent slopes, moderately eroded	77
CpA—Chili silt loam, 0 to 2 percent slopes	77
CpB—Chili silt loam, 2 to 6 percent slopes	77
CpC—Chili silt loam, 6 to 12 percent slopes	78
CuB—Chili-Urban land complex, undulating	78
Cv—Condit silt loam	79
ElB—Ellsworth silt loam, 2 to 6 percent slopes	80
ElB2—Ellsworth silt loam, 2 to 6 percent slopes, moderately eroded	80
ElC—Ellsworth silt loam, 6 to 12 percent slopes	80
ElC2—Ellsworth silt loam, 6 to 12 percent slopes, moderately eroded	80
ElE2—Ellsworth silt loam, 12 to 25 percent slopes, moderately eroded	80
ElF—Ellsworth silt loam, 25 to 70 percent slopes	81
EsB—Ellsworth silt loam, sandstone substratum, 2 to 6 percent slopes	81
EsC2—Ellsworth silt loam, sandstone substratum, 6 to 12 percent slopes, moderately eroded	81
EuB—Ellsworth-Urban land complex, undulating	81
FcA—Fitchville silt loam, 0 to 2 percent slopes	82
FcB—Fitchville silt loam, 2 to 6 percent slopes	82
FlA—Fitchville silt loam, low terrace, 0 to 2 percent slopes	83
GbC—Geeburg silt loam, 6 to 18 percent slopes	83
GfA—Glenford silt loam, 0 to 2 percent slopes	84
GfB—Glenford silt loam, 2 to 6 percent slopes	84
GfC2—Glenford silt loam, 6 to 12 percent slopes, moderately eroded	85
HsA—Haskins loam, 0 to 2 percent slopes	85
HsB—Haskins loam, 2 to 6 percent slopes	86
Hy—Holly silt loam	86
JtA—Jimtown loam, 0 to 2 percent slopes	87
JtB—Jimtown loam, 2 to 6 percent slopes	87
Ju—Jimtown-Urban land complex	87
Ld—Linwood muck	89
Le—Lobdell silt loam	89
Ln—Lorain silty clay loam	90
LoB—Loudonville silt loam, 2 to 6 percent slopes	91
LoC—Loudonville silt loam, 6 to 12 percent slopes	91
LoC2—Loudonville silt loam, 6 to 12 percent slopes, moderately eroded	91
LoE2—Loudonville silt loam, 12 to 25 percent slopes, moderately eroded	91
Ly—Luray silt loam	92
MgA—Mahoning silt loam, 0 to 2 percent slopes	93
MgB—Mahoning silt loam, 2 to 6 percent slopes	93
MlA—Mahoning silt loam, sandstone substratum, 0 to 2 percent slopes	93
MlB—Mahoning silt loam, sandstone substratum, 2 to 6 percent slopes	93
MnA—Mahoning-Urban land complex, nearly level	94
Mr—Miner silty clay loam	95
Od—Olmsted loam	95
Or—Orrville silt loam	96
Os—Orrville silt loam, bedrock substratum	96

	Page
OtB—Oshtemo sandy loam, 2 to 6 percent slopes	97
ReA—Ravenna silt loam, 0 to 2 percent slopes	98
ReB—Ravenna silt loam, 2 to 6 percent slopes	98
RnA—Ravenna-Urban land complex, nearly level	98
RoB—Rawson loam, 2 to 6 percent slopes	99
RsB—Rittman silt loam, 2 to 6 percent slopes	100
RsB2—Rittman silt loam, 2 to 6 percent slopes, moderately eroded	100
RsC—Rittman silt loam, 6 to 12 percent slopes	101
RsC2—Rittman silt loam, 6 to 12 percent slopes, moderately eroded	101
RsE2—Rittman silt loam, 12 to 25 percent slopes, moderately eroded	101
RsF—Rittman silt loam, 25 to 70 percent slopes	101
ScF—Schaffenaker loamy sand, 25 to 70 percent slopes	102
Sg—Sebring silt loam	102
St—Sebring silt loam, till substratum	103
WaA—Wadsworth silt loam, 0 to 2 percent slopes	104
WaB—Wadsworth silt loam, 2 to 6 percent slopes	105
WbB—Wadsworth-Urban land complex, undulating	105
Wc—Wallkill silt loam	106
Wt—Willette muck	106
WuB—Wooster silt loam, 2 to 6 percent slopes	107
WuB2—Wooster silt loam, 2 to 6 percent slopes, moderately eroded	107
WuC2—Wooster silt loam, 6 to 12 percent slopes, moderately eroded	108
WuE2—Wooster silt loam, 12 to 25 percent slopes, moderately eroded	108
WuF—Wooster silt loam, 25 to 70 percent slopes	108

Summary of Tables

	Page
Crops and pasture	
Estimated average yields per acre of principal crops under two levels of management (table 1)	15
Woodland	
Potential productivity, limitations in management, and favored species of wood crops by woodland suitability groups (table 2)	20
Wildlife	
Suitability of the soils for elements of wildlife habitat and kinds of wildlife (table 3)	24
Engineering uses of the soils	
Engineering test data (table 4)	30
Estimated soil properties significant in engineering (table 5)	32
Engineering interpretations (table 6)	40
Town and country development	
Estimated degree and kinds of limitations of soils for town and country planning (table 7)	52
Descriptions of the soils	
Approximate acreage and proportionate extent of the soils (table 8)	66
Formation and classification of the soils	
Classification of the soil series (table 9)	111
Laboratory data	
Laboratory data (table 10)	114
General nature of the county	
Temperature and precipitation (table 11)	118

SOIL SURVEY OF MEDINA COUNTY, OHIO

BY E. N. HAYHURST, E. L. MILLIRON, AND J. R. STEIGER, SOIL CONSERVATION SERVICE [1]

UNITED STATES DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE,
IN COOPERATION WITH OHIO DEPARTMENT OF NATURAL RESOURCES, DIVISION OF LANDS AND SOIL, AND THE
OHIO AGRICULTURAL RESEARCH AND DEVELOPMENT CENTER

MEDINA COUNTY is in the northeastern part of Ohio (fig. 1). It has a total area of 271,744 acres, or about 425 square miles. Medina is the county seat, and in 1970 it had a population of 10,813. The population of the county was 82,717.

Most of the land area in the county is farmland, but the county is in the expanding metropolitan and industrialized area in northeastern Ohio where an increasing amount of acreage is being diverted to nonfarm uses. Dairying and cash grain farming are the main farm enterprises in the county. There are many different types of industries in the county. The bee industry is one of the oldest.

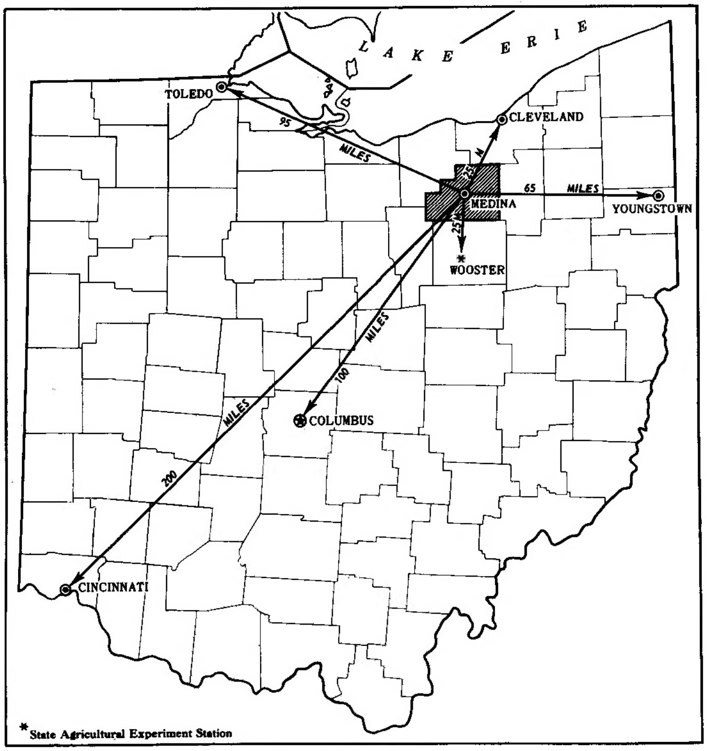


Figure 1.—**Location of Medina County in Ohio.**

How This Survey Was Made

Soil scientists made this survey to learn what kinds of soils are in Medina County, where they are located, and how they can be used. The soil scientists went into the county knowing they likely would find many soils they had already seen and perhaps some they had not. They observed the steepness, length, and shape of slopes, the size of streams, the kinds of native plants or crops, the kinds of rock, and many facts about the soils. They dug many holes to expose soil profiles. A profile is the sequence of natural layers, or horizons, in a soil; it extends from the surface down into the parent material that has not been changed much by leaching or by the action of plant roots.

The soil scientists made comparisons among the profiles they studied, and they compared these profiles with those in counties nearby and in places more distant. They classified and named the soils according to nationwide, uniform procedures. The *soil series* and the *soil phase* are the categories of soil classification most used in a local survey.

Soils that have profiles almost alike make up a soil series. Except for different texture in the surface layer, all the soils of one series have major horizons that are similar in thickness, arrangement, and other important characteristics. Each soil series is named for a town or other geographic feature near the place where a soil of that series was first observed and mapped. Mahoning and Bennington, for example, are the names of two soil series. All the soils in the United States having the same series name are essentially alike in those characteristics that affect their behavior in the undisturbed landscape.

Soils of one series can differ in texture of the surface layer and in slope, stoniness, or some other characteristic that affects use of the soils by man. On the basis of such differences, a soil series is divided into phases. The name of a soil phase indicates a feature that affects management. For example, Cardington fine sandy loam, 2 to 6 percent slopes, is one of several phases within the Cardington series.

After a guide for classifying and naming the soils had been worked out, the soil scientists drew the boundaries of the individual soils on aerial photographs. These photographs show woodlands, buildings, field borders, trees, and other details that help in drawing boundaries accurately. The soil map at the back of this publication was prepared from the aerial photographs.

[1] Others assisting with the field survey were A. RITCHIE, J. E. ERNST, D. K. MUSGRAVE, and R. C. ROSELER, Ohio Department of Natural Resources, Division of Lands and Soil, and G. J. POST, M. E. BERRY, P. C. JENNY, and D. L. BACON, Soil Conservation Service.

The areas shown on a soil map are called mapping units. On most maps detailed enough to be useful in planning the management of farms and fields, a mapping unit is nearly equivalent to a soil phase. It is not exactly equivalent, because it is not practical to show on such a map all the small, scattered bits of soil of some kind that have been seen within an area that is dominantly of a recognized soil phase.

Some mapping units are made up of soils of different series, or of different phases within one series. One kind of mapping unit shown on the soil map of Medina County is the soil complex.

A soil complex consists of areas of two or more soils, so intricately mixed or so small in size that they cannot be shown separately on the soil map. Each area of a complex contains some of each of the two or more dominant soils, and the pattern and relative proportions are about the same in all areas. Generally, the name of a soil complex consists of the names of the dominant soils, joined by a hyphen. Bennington-Tiro silt loams, 0 to 2 percent slopes, is an example.

In most areas surveyed there are places where the soil material has been disturbed by activities such as mining and highway construction. Examples of such places in this survey are gravel pits and made land. These places are identified on the maps by special land feature symbols.

While a soil survey is in progress, soil scientists take soil samples needed for laboratory measurements and for engineering tests. Laboratory data from the same kind of soil in other places are also assembled. Data on yields of crops under defined practices are assembled from farm records and from field or plot experiments on the same kind of soil. Yields under defined management are estimated for all the soils.

Soil scientists observe how soils behave when used as a growing place for native and cultivated plants, and as material for structures, foundations for structures, or covering for structures. They relate this behavior to properties of the soils. For example, they observe that filter fields for onsite disposal of sewage fail on a given kind of soil, and they relate this to the slow permeability of the soil or its high water table. They see that streets, road pavements, and foundations for houses are cracked on a named kind of soil, and they relate this failure to the high shrink-swell potential of the soil material. Thus, they use observation and knowledge of soil properties, together with available research data, to predict limitations or suitability of soils for present and potential uses.

After data have been collected and tested for the key, or benchmark, soils in a survey area, the soil scientists set up trial groups of soils. They test these groups by further study and by consultation with farmers, agronomists, engineers, and others. They then adjust the groups according to the results of their studies and consultation. Thus, the groups that are finally evolved reflect up-to-date knowledge of the soils and their behavior under current methods of use and management.

General Soil Map

The general soil map at the back of this report shows, in color, the soil associations in Medina County. A soil association is a landscape that has a distinctive pattern of soils. It normally consists of one or more major soils and at least one minor soil, and it is named for the major soils. The soils in one association may occur in another, but in a different pattern.

A map showing soil associations is useful to people who want a general idea of the soils in the county, who want to compare different parts of the county, or who want to know the location of large tracts that are suitable for a certain kind of land use. Such a map is a useful general guide in managing a watershed, a wooded tract, or a wildlife area, or in planning engineering works, recreational facilities, and community developments. It is not a suitable map for planning the management of a farm or field, or for selecting the exact location of a road, building, or similar structure, because the soils in any one association ordinarily differ in slope, depth, drainage, and other characteristics that affect their management.

The soil associations in this survey have been grouped into two general kinds of landscapes for broad interpretive purposes. Each of the broad groups and the soil associations in each group are described in the following pages.

Soils That Formed in Glacial Till on Uplands

Six of the soil associations in Medina County are in this group. These associations occur throughout the county. The soils in these associations make up about 88 percent of the county. They are mostly somewhat poorly drained to moderately well drained and generally have slow permeability. The soils that are not used for urban development are used for corn, wheat, soybeans, oats, legume-grass hay, pasture, and other crops commonly grown in the County.

1. Ellsworth-Mahoning association

Nearly level to moderately steep, moderately well drained and somewhat poorly drained soils that formed in silty clay loam glacial till

This association is on uplands in the central and northeastern parts of the county. The topography in this association is mainly nearly level to moderately steep, but it is steep to very steep along some valley sides of the major streams.

This association makes up about 12 percent of the county. It is about 50 percent Ellsworth soils and 15 percent Mahoning soils. The rest is soils that are less extensive.

Ellsworth and Mahoning soils have a clayey subsoil that is soft and sticky when wet. The Ellsworth soils are moderately well drained and are mainly gently sloping to moderately steep, but in a few places they are steep to very steep. They are seasonally wet for short periods during the year. Mahoning soils are somewhat poorly drained and are nearly level and gently sloping. They are seasonably wet for longer periods than Ellsworth soils.

Less extensive in this association are Lobdell soils that are on narrow flood plains; Loudonville and Schaffenaker soils that are shallower to bedrock than Ellsworth and Mahoning soils, and Miner soils that are wetter; and Fitchville and Chili soils that formed in silty or gravelly material.

The major limitations to use of this association are seasonal wetness, particularly on Mahoning soils, and the clayey, slowly permeable subsoil of the Ellsworth and Mahoning soils. Erosion is a hazard in sloping areas. Slow permeability and wetness are severe limitations for such nonfarm uses as septic tank filter fields. In areas where slope is not a concern, Ellsworth soils have better natural drainage and have fewer limitations for building sites than Mahoning soils. Artificial drainage and erosion control are the major management needs of this association.

2. *Mahoning-Ellsworth association*

Nearly level to sloping, somewhat poorly drained and moderately well drained soils that formed in silty clay loam glacial till

This association is on uplands in the northern and western parts of the county. Except for some steeper slopes along the sides of stream valleys, the topography in this association is nearly level to sloping and is interspersed with slight depressions and low knolls.

This association makes up about 33 percent of the county. It is about 65 percent Mahoning soils and 20 percent Ellsworth soils. The rest is soils that are less extensive.

Mahoning and Ellsworth soils have a clayey subsoil that is soft and sticky when wet and is underlain by silty clay loam glacial till. The glacial till is generally greater than 5 feet thick, but a few areas, particularly in Litchfield, York, and Liverpool Townships, are underlain by bedrock at a depth of 40 to 60 inches. Mahoning soils are somewhat poorly drained and are nearly level and gently sloping. They are depressional in some areas. Undrained areas of these soils are commonly wet for extended periods in winter and spring. Ellsworth soils are moderately well drained. These sloping soils are on the low knolls. They are wet for shorter periods than Mahoning soils.

Less extensive in this association are wetter glacial till soils, such as Condit soils; soils on narrow flood plains, such as Holly and Orrville soils; and soils formed in silty, sandy, or gravelly material, such as Haskins, Fitchville, and Jimtown soils.

The major limitations to use of this association are seasonal wetness, particularly on Mahoning soils, and the clayey, slowly permeable subsoil. Ponding of surface water in the depressional areas following heavy rainfall is common. Unless proper management practices are used, erosion is a hazard in sloping areas that are cultivated. Wetness and the hazard of erosion in sloping areas are major limitations for farming. Artificial drainage and erosion control practices are the major management needs of this association. Where artificial drainage is installed, a combination of tile and surface drains is the most commonly used system. This association is used mainly for farm crops common to the county. Because of better natural drainage, Ellsworth soils have fewer limitations for building sites and some other nonfarm uses than Mahoning soils.

3. *Canfield-Wooster-Ravenna association*

Nearly level to moderately steep, moderately well drained, well drained, and somewhat poorly drained soils that formed in loam glacial till and that have a restrictive subsoil layer (fragipan)

This association is on uplands in the southeastern part of the county. It consists mainly of nearly level to moderately steep soils that formed in loamy glacial till. Some soils that have steeper slopes are along the sides of stream valleys.

This association makes up about 9 percent of the county. It is about 45 percent Canfield soils, 30 percent Wooster soils, and 10 percent Ravenna soils. The rest is soils that are less extensive.

All the major soils in the association have a very dense and compact layer in the subsoil, called a fragipan, that restricts the downward movement of water and the growth of roots. Canfield soils are moderately well drained and are mainly gently sloping to sloping. Wooster soils are well drained and are in the more sloping and moderately steep areas of the association. Ravenna soils are somewhat poorly drained and nearly level to gently sloping.

Less extensive soils in this association are wetter Sebring soils in level and depressional areas; soils on narrow flood plains, such as Chagrin soils; soils that formed in silty or gravelly deposits, such as Glenford and Chili soils; and soils that are shallower to bedrock, such as Berks, Loudonville, and Schaffenaker soils.

The major limitations to use of this association are the hazard of erosion in sloping areas of Canfield and Wooster soils and seasonal wetness on Ravenna soils. Slow permeability in the fragipan is an additional limitation of these soils for certain nonfarm uses. Erosion in areas that are being developed for nonfarm uses and farm uses causes sedimentation if proper management practices are not used. With the use of improved soil-fertility and management practices that include control of erosion in sloping areas and artificial drainage on Ravenna soils, the major soils in this association are suited to cultivated crops, truck crops, and fruit crops. Where slope is not a limitation, Canfield and Wooster soils are suited to use for building sites.

4. *Rittman-Wadsworth association*

Nearly level to moderately steep, moderately well drained and somewhat poorly drained soils that formed in silty clay loam or clay loam glacial till and that have a restrictive subsoil layer (fragipan)

This association is on uplands mostly in the south-central part of the county. The major soils formed in silty clay loam or clay loam glacial till and are mostly nearly level to moderately steep. Some soils that have steeper slopes are along the sides of stream valleys.

This association makes up about 16 percent of the county. It is about 50 percent Rittman soils and 25 percent Wadsworth soils. The rest is soils that are less extensive.

All the major soils in the association have a dense and compact layer in the subsoil, called a fragipan, that restricts the downward movement of water and the growth of roots. Rittman soils are moderately well drained. These soils are in the more sloping areas and in some steep areas. They are seasonally wet for short periods during the year. Wadsworth soils are somewhat poorly drained and are nearly level and gently

sloping. These soils are seasonally wet for longer periods than the adjacent Rittman soils.

Less extensive in this association are soils on flood plains, such as Lobdell soils, and soils that formed in silty, sandy, or gravelly deposits such as Fitchville, Oshtemo, and Chili soils.

The major limitations to use of this association are the hazard of erosion in unprotected sloping areas and seasonal wetness caused by a high water table. Slow permeability in the fragipan is a severe limitation for septic tank filter fields and certain other nonfarm uses. In areas where slope is not a concern, Rittman soils have better natural drainage and have fewer limitations for building sites than Wadsworth soils. The soils in this association are used mostly for crops common to the county and for dairying. Under intensive management, these soils are productive. Control of erosion on the sloping soils and artificial drainage, particularly on Wadsworth soils, are the major management needs of this association.

5. *Bennington-Cardington association*

Nearly level to gently sloping, somewhat poorly drained and moderately well drained soils that formed in silty clay loam or clay loam glacial till

This association is in three broad areas on uplands in the southern and western parts of Medina County. The soils in each of these areas are mostly nearly level to gently sloping. Some areas of more sloping soils are on the sides of stream valleys.

This association makes up about 12 percent of the county. It is about 70 percent Bennington soils and 15 percent Cardington soils. The rest is soils that are less extensive.

Bennington and Cardington soils have a silty clay loam subsoil that is soft and sticky when wet. Bennington soils are somewhat poorly drained and are nearly level and gently sloping. They are in broad areas. Cardington soils are moderately well drained. These soils are in gently sloping areas on knolls and in the more sloping areas along streams and drainageways.

Less extensive in this association are somewhat coarser textured soils, such as Tiro and Haskins soils; more poorly drained soils, such as Condit soils; and soils on flood plains, such as Orrville soils.

The major limitations to use of this association are ponding in most depressional areas following heavy rainfall. Slow permeability in the subsoil and substratum of the Bennington and Cardington soils is a severe limitation for such nonfarm uses as septic tank filter fields. Because of better natural drainage, Cardington soils have fewer limitations than Bennington soils for building sites. The association is used mostly for farm crops common to the county and for dairying. Under intensive management, including artificial drainage on Bennington soils, the major soils are productive.

6. *Cardington-Bennington association*

Mostly gently sloping to moderately steep, moderately well drained and somewhat poorly drained soils that formed in silty clay loam or clay loam glacial till

This association is on uplands in the south-central part of the county. The soils in this association are mostly gently sloping to moderately steep, but drainageways that dissect the association have steep slopes that cause rapid runoff.

This association makes up about 6 percent of the county. It is about 65 percent Cardington soils and 20 percent Bennington soils. The rest is soils that are less extensive.

The soils in this association have a silty clay loam subsoil that is soft and sticky when wet. Cardington soils are moderately well drained and are mostly gently sloping and moderately steep. Bennington soils are somewhat poorly drained and are nearly level to gently sloping.

Less extensive in this association are more silty soils, such as Glenford soils; some loamy soils, such as Chili soils that are on stream terraces; and soils on flood plains, such as Orrville and Lobdell soils.

The major limitations to use of this association are the hazard of erosion in sloping areas that are not protected by plant cover and seasonal wetness on the less sloping Bennington soils. Slow permeability in the subsoil and substratum of the Bennington and Cardington soils is a severe limitation for such nonfarm uses as septic tank filter fields. Because of better natural drainage, Cardington soils have fewer limitations than Bennington soils for building sites in areas where slope is not a concern. This association is used mostly for crops common to the county. Under intensive management, including erosion control in unprotected areas and artificial drainage on Bennington soils, the major soils are productive.

Soils That Formed in Lacustrine, Alluvial, or Glacial Outwash Deposits on Terraces and Flood Plains and in Glacial Outwash Areas

Three of the soil associations in Medina County are in this group. These associations are generally in the southern part of the county. The soils in these associations make up about 12 percent of the county. They are mostly somewhat poorly drained or very poorly drained, and there are some limited areas of moderately well drained or well drained soils. The soils range from very clayey, lake-deposited soils to coarse-textured gravelly soils and organic soils. Where adequately drained these soils are used for crops common to the area.

7. *Haskins-Caneadea-Lobdell association*

Nearly level to gently sloping, somewhat poorly drained and moderately well drained soils that formed in loamy material overlying clayey glacial lake-deposited sediment or in clayey sediment and stream-deposited sediment; on terraces and flood plains

This association is along the East Branch of the Black River. It includes both the present flood plains and a high, level terrace that represents a former glacial lake basin. The soils are nearly level to gently sloping. In places, some short, narrow, very steep escarpments separate the high terraces from the flood plains.

This association makes up about 2 percent of the county. It is about 25 percent Haskins soils, 20 percent

Caneadea soils, and 20 percent Lobdell soils. The rest is soils that are less extensive.

Haskins soils are somewhat poorly drained and are nearly level to gently sloping. They formed in loamy material overlying clayey glacial lake-deposited sediment. Caneadea soils are somewhat poorly drained and are nearly level to gently sloping. They formed in clayey glacial lake-deposited sediment. Lobdell soils are level and moderately well drained. They are on flood plains. They formed in loamy material deposited by floodwaters.

Less extensive in this association are narrow areas of Chagrin soils along the streams; small areas of the more loamy Jimtown and Bogart soils; and scattered areas of Fitchville, Canadice, and Rawson soils.

The major limitations to use of this association are seasonal wetness on Haskins and Caneadea soils and the hazard of flooding of Lobdell soils. Artificial drainage is needed on Haskins and Caneadea soils, but the clayey very slowly permeable subsoil and substratum of Caneadea soils makes drainage difficult. Also, Caneadea soils dry out more slowly in spring than other major soils in the association. Under intensive management, all the soils in this association are suited to crops and dairying. Most areas of this association are used for corn, wheat, oats, soybeans, and meadow crops, but the flood plains are used mainly for pasture. The hazard of flooding is a severe limitation on Lobdell soils for many nonfarm uses.

8. *Fitchville-Chili-Bogart association*

Nearly level to sloping, somewhat poorly drained to well drained soils that formed in silty glacial lake-deposited sediment or in loamy material overlying sand and gravel; mainly on terraces

This association consists of several areas, mostly in the southern and eastern parts of Medina County. It typically is on low-lying stream terraces and former glacial lakebeds, which were in old glacial drainageways, near the headwaters of major streams. Except for some areas of more sloping soils on the sides of stream valleys, the soils are nearly level to gently sloping.

This association makes up about 8 percent of the county. It is about 30 percent Fitchville soils, 25 percent Chili soils, and 10 percent Bogart soils. The rest is soils that are less extensive.

Fitchville soils are somewhat poorly drained and nearly level to gently sloping. These soils formed mostly in silty sediment deposited in former glacial lakes. They have a subsoil that is soft and slightly sticky when wet. Chili soils are well drained and are on terraces. These soils are in gently sloping areas on the sides of stream valleys. They formed in loamy material overlying sand and gravel. Bogart soils are moderately well drained and gently sloping. These soils are on terraces. They formed in loamy material overlying sand and gravel.

Less extensive in this association are small areas of Sebring, Glenford, and Luray soils that formed in moderately fine textured lake-deposited material, narrow areas of Orrville and Holly soils along small streams, small areas of organic Carlisle soils, and small areas of somewhat poorly drained Jimtown soils.

The major limitation to use of Fitchville soils is seasonal wetness. Poor stability, occasional flooding, and moderately slow permeability are also limitations of these soils, particularly for many nonfarm uses. Because of generally good natural drainage and favorable topography, Chili and Bogart soils have few limitations for many uses. These soils are droughty during dry seasons, but they can be irrigated when used for cultivated crops. Chili and Bogart soils have few limitations for homesites, but there is a possibility of ground-water contamination where septic tanks are used for sewage disposal, particularly in high-density subdivisions. Many areas of Fitchville soils and other less extensive areas of wet soils in this association have been drained artificially and, along with the better drained soils, are used for crops common to the county. The underlying sand and gravel of Chili and Bogart soils in some areas of the association are suitable for commercial use.

9. *Carlisle-Luray-Lorain association*

Nearly level, very poorly drained organic soils and soils on glacial lakebeds; the soils formed in thick layers of partly decomposed plants or in silty and clayey glacial lake-deposited sediment

This association is mainly in the southern and eastern parts of the county. The soils are in depressional areas on former glacial lakebeds and in swamps, and they are commonly surrounded by soils of the Fitchville-Chili-Bogart association. All the soils in this association are dark colored and very poorly drained.

This association makes up about 2 percent of the county. It is about 25 percent Carlisle soils, 25 percent Luray soils, and 15 percent Lorain soils. The rest is soils that are less extensive.

Carlisle muck soils are conspicuous by their black color. These soils formed in layers of partly decomposed remains of plants and are more than 51 inches deep. Luray soils formed in silty or loamy material deposited in former glacial lakes. Lorain soils formed in clayey material deposited in former glacial lakes.

Less extensive in the association are Linwood and Willette muck soils, which commonly are on the outer perimeter of Carlisle soils, and small areas of Sebring, Olmsted, Holly, Orrville, and Wallkill soils.

The major limitations to uses of this association are excessive wetness and ponding. Because these soils are in depressions, artificial drainage outlets are normally difficult to establish and maintain. Subsidence when the water table is low and soil blowing are also limitations to the use of Carlisle soils. When dry, these soils are susceptible to damage by fire.

Under intensive management, including the installation of intensive artificial drainage systems, the soils in this association are moderately productive to highly productive. If drained, they can be used for truck crops, corn, potatoes, and bluegrass sod. The swampy, undrained areas are suitable for use as wetland wildlife habitat or as pond sites. The severe hazard of wetness and poor stability are severe limitations for building sites, highways, and many other nonfarm uses.

Use and Management of the Soils[2]

This section contains information on the use and management of the soils in the county for crops and pasture and also for woodland, for wildlife habitat, for selected engineering uses, and for town and country planning. Also given are estimated yields of the principal crops and discussions of special crops and irrigation.

Crops and Pasture

In this section general practices of soil management are discussed, the system of capability classification used by the Soil Conservation Service is described, and suggested management for capability groups of soils is given. Also, a table lists estimated yields of principal crops under two levels of management. Special crops grown for commercial use are discussed, and the suitability of the soils for irrigated crops is given.

Field crops commonly grown in Medina County are corn, oats, wheat, soybeans, and other small grain. Plants suitable for pasture and hay are alfalfa, alsike clover, Ladino clover, red clover, birdsfoot trefoil, timothy, orchardgrass, bromegrass, and bluegrass. Special crops commonly grown are sweet corn, tomatoes, peppers, melons, strawberries, and other crops adapted to the climate.

General practices of management

Although the soils in Medina County vary in their suitability for specific crops and require different types of management, some basic or general management practices are needed on practically all the soils. This section discusses the basic practices of maintaining fertility, using crop residue, improving drainage, and controlling erosion. The management of specified groups of soils is discussed under "Management by capability units," and more specific information can be obtained by consulting a representative of the Soil Conservation Service or of the Ohio Cooperative Extension Service.

Maintenance of adequate levels of fertility.—Because most of the soils in the county, particularly the light-colored ones on the uplands and terraces, are naturally acid and low in content of plant nutrients, additions of lime and fertilizer are needed. Such additions need to be based on the results of soil tests, on the needs of the crop, and on the expected level of yields.

Use of crop residue.—Most of the soils in the county, particularly the light-colored ones, are not naturally high in organic-matter content. To offset this deficiency, all crop residue should be incorporated into the soil. If soybeans or other crops that produce little residue are grown, the cropping system needs to provide cover crops or sod crops, or both. Maintaining the organic-matter content of soils helps to insure good soil structure and tilth.

Drainage.—In this county wetness is a hazard on about 59 percent of the acreage suitable for cultivated crops. Only limited practices are needed to improve drainage on the moderately well drained soils. Crops grow well on most of the somewhat poorly drained, poorly drained, and very poorly drained soils where excess water has been removed by tile drains or surface drains, or both. Land smoothing is also needed in some areas.

Control of erosion.—Controlling erosion is one of the main management concerns in Medina County. Erosion is a hazard on the gently sloping to very steep soils. Much of the acreage that is suitable for cultivated crops is moderately eroded. Some areas are subject to wetness and to erosion.

Practices of erosion control commonly used in the county are diversions, waterways, contour stripcropping, contour tillage, minimum tillage, using crop residue, and planting close-growing crops.

The moderately eroded soils have lost part of the fertility needed to grow plants. Their plow layer is now a mixture of the original surface layer and part of the less fertile subsoil. Thus, the moderately eroded soils differ from the slightly eroded or noneroded soils in the county by having a lower organic-matter content, poorer tilth, greater runoff potential, less effective rooting depth, and slightly lower available water capacity. These soils should be cultivated less frequently and maintained for longer periods in close-growing (sod type) vegetation than either the slightly eroded or noneroded soils.

Capability grouping

Capability grouping shows, in a general way, the suitability of soils for most kinds of field crops. The soils are grouped according to their limitations when used for field crops, the risk of damage when they are used, and the way they respond to treatment. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils; does not take into consideration possible but unlikely major reclamation projects; and does not apply to horticultural crops or other crops requiring special management.

Those familiar with the capability classification can infer from it much about the behavior of soils when used for other purposes, but this classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for range, for forest trees, or for engineering.

In the capability system, the kinds of soil are grouped at three levels: the capability class, the subclass, and the unit. These levels are described in the following paragraphs.

CAPABILITY CLASSES, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use, defined as follows:

Class I soils have few limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants or require special conservation practices, or both.

Class IV soils have very severe limitations that

[2] JOHN E. HOCKER, district conservationist, Soil Conservation Service, helped to prepare this section.

reduce the choice of plants or require very careful management, or both.

Class V soils are subject to little or no erosion but have other limitations, impractical to remove, that limit their use largely to pasture or range, woodland, or wildlife habitat (none in Medina County).

Class VI soils have severe limitations that make them generally unsuited to cultivation and limit their use largely to pasture or range, woodland, or wildlife habitat.

Class VII soils have very severe limitations that make them unsuited to cultivation and that restrict their use largely to pasture or range, woodland, or wildlife habitat.

Class VIII soils and landforms have limitations that preclude their use for commercial crop production and restrict their use to recreation, wildlife habitat, water supply, or to esthetic purposes (none in Medina County).

CAPABILITY SUBCLASSES are soil groups within one class; they are designated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is too cold to too dry. (Subclass *c* is not used in Medina County.)

In class I there are no subclasses, because the soils of this class have few limitations. Class V can contain, at the most, only the subclasses indicated by *w*, *s*, and *c*, because the soils in class V are subject to little or no erosion, though they have other limitations that restrict their use largely to pasture, woodland, wildlife habitat, or recreation.

CAPABILITY UNITS are soil groups within the subclasses. The soils in one capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management and to have similar productivity and other responses to management. Thus, the capability unit is a convenient grouping for making many statements about management of soils. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, IIe–4 or IIIe–3. Thus, in one symbol, the Roman numeral designates the capability class, or degree of limitation; the small letter indicates the subclass, or kind of limitation, as defined in the foregoing paragraph; and the Arabic numeral specifically identifies the capability unit within each subclass.

Management by capability units

The soils in Medina County have been placed into 28 capability units. The soils in each unit have about the same limitations, are subject to similar risks of damage, need about the same kind of management, and respond to management in about the same way. Mapping units that include urban land have not been placed into a capability unit because they are generally the sites for industrial, residential, or other community development.

In the following pages each capability unit is described and management for each is discussed. To determine the soils in each capability unit, refer to the "Guide to Mapping Units" at the back of this survey.

In the discussion of the capability units, improved and optimum levels of management are mentioned for crops and pasture. These levels of management are defined in the section "Estimated yields."

In the descriptions of the capability units, depth of the rooting zone refers to the depth of the soil to a high water table; a fragipan, a layer of dense clay or compact till; bedrock; or other material that restricts the growth of roots. Reference to low, moderate, or high available water capacity is related to the normal depth of roots of corn, small grain, or other commonly grown field crops.

These descriptions also point out soil features that limit the use of the soils for crops or pasture. Only general recommendations for overcoming the limitations are given. Erosion control or drainage, for example, can be achieved by many methods or combinations of practices on any given field of any kind of soil. For specific information regarding erosion control, artificial drainage, suited crop varieties, or other management practices, the reader should contact the nearest office of the Soil Conservation Service or the Ohio Cooperative Extension Service.

CAPABILITY UNIT I–1

The only soil in this unit is Glenford silt loam, 0 to 2 percent slopes. This soil is nearly level and moderately well drained. It is mainly on stream terraces. It formed in 3½ to 5 feet of silty material overlying loamy water-deposited material. This soil commonly is above the level of flooding, and erosion is not a hazard.

This soil has a deep rooting zone that is typically medium acid to very strongly acid, unless limed. The available water capacity is high. Permeability is moderately slow. This soil is seldom too wet or too dry to be cropped.

This soil has few limitations for crops and pasture. It is easily worked but is susceptible to surface crusting. Cultivation and planting can be done fairly early. Good tilth of the plow layer can be maintained by using crops that produce large amounts of residue.

This soil is suited to field crops, hay, and pasture plants commonly grown in the county and to many special crops. Under intensive management, continuously cultivated crops can be grown. This soil is suited to irrigation.

CAPABILITY UNIT IIe–1

This unit consists of gently sloping, moderately well drained and well drained soils. These soils are on outwash plains or on stream terraces that normally are above flood stage. They have a surface layer of loam or silt loam. Most of the soils have a loamy subsoil, but a few have a subsoil that is loamy in the upper part and clayey in the lower part. A few soils have compact clayey or silty material at a depth of about 5 feet or more. Thus, during seasonal wet periods, the overlying

loamy part of these soils becomes saturated and temporarily waterlogged.

The soils in this unit have a moderately deep or deep rooting zone that is acid unless it is limed. The available water capacity is low to moderate. Permeability is moderate to rapid in the loamy layers of these soils.

The hazard of erosion is moderate. Mechanical practices for controlling erosion are difficult or impractical in some areas because of short, complex slopes. Plant nutrients are easily removed from these soils by leaching. Under intensive management, crops respond well. Management practices are needed to control erosion, conserve moisture, maintain or improve the content of organic matter, and maintain fertility.

These soils warm up early in spring and are easy to work. They are suited to the crops commonly grown in the county and to adapted special crops. Because the available water capacity is limited, crops that mature early are better suited to these soils than those that mature late in summer. Row crops can be grown frequently if erosion is controlled, crop residue is used, and fertility is maintained at a high level. These soils are suited to irrigation. To provide forage in dry periods, the seeding mixture for hay or pasture should include grasses and legumes that are deep rooted and drought tolerant.

CAPABILITY UNIT IIe–2

The only soil in this unit is Glenford silt loam, 2 to 6 percent slopes. This soil is gently sloping and moderately well drained. It is on small terrace remnants. It formed in lake-laid material that is high in silt content.

This soil has a deep rooting zone that is typically acid. The available water capacity is high. Permeability is moderately slow, and runoff is medium to rapid. The surface layer is susceptible to crusting.

The hazard of erosion is the major limitation to the use of this soil. In cultivated areas, particularly where this soil is adjacent to larger areas of less sloping soils that are cultivated, erosion control practices are needed. Also needed in frequently cultivated areas are practices for maintaining fertility and organic-matter content.

Under intensive management, cultivated crops, including special crops, can be grown frequently. Under less intensive management, the cropping system should include close-growing crops, grasses, and legumes. Returning crop residue to the soil is necessary for maintaining tilth and controlling erosion.

This soil is easily worked, and crops can be planted fairly early in spring. It is suited to the crops and pasture plants commonly grown in the county. It is well suited to early pasture and to irrigation.

CAPABILITY UNIT IIe–3

This unit consists of gently sloping, well drained and moderately well drained soils. These soils are on glaciated upland. They have a surface layer of silt loam or fine sandy loam.

The soils in this unit have a moderately deep to deep rooting zone, and available water capacity is moderate within this zone. Permeability is moderate to slow, and runoff is medium to rapid. These soils have a dense, compact fragipan in their subsoil, or they are underlain by dense, compact glacial till at a depth of about 2½ feet. Both the fragipan and the glacial till restrict the penetration of roots and the movement of water. Surface crusting is likely in cultivated areas.

Some areas of these soils are moderately eroded. Maintaining desirable soil structure and tilth on the moderately eroded soils is more difficult than on the slightly eroded soils because the plow layer on the moderately eroded soils is a mixture of the original surface layer and the less fertile subsoil material. The natural fertility is reduced through a decrease in organic-matter content, essential minerals, and effective rooting depth. Also, the available water capacity of the moderately eroded soils is less than that of the slightly eroded soils.

A moderate hazard of erosion is the major limitation to the use of these soils for field crops. Seasonal wetness caused by seepage is also a limitation in some areas. Random tile lines can be used to drain seeps, but lateral water movement to the tile lines is slow.

These soils are suited to field crops and hay and pasture plants commonly grown in the county. They are less well suited to special crops than are the soils in capability units IIe–1 and IIe–2. Cultivated crops can be grown frequently under intensive management. Erosion is difficult to control, however, where continuous row crops are grown on soils that have slopes of more than 4 percent. Cattle grazing on these soils during wet periods can cause soil compaction and a lower pasture yield. Grasses and legumes that withstand some wetness are suitable for hay and pasture.

CAPABILITY UNIT IIe–4

The only soil in this unit is Loudonville silt loam, 2 to 6 percent slopes. This soil is well drained. It is on glaciated uplands and is underlain by bedrock at a depth of 20 to 40 inches.

This soil has a moderately deep rooting zone. The available water capacity is low to moderate. Permeability is moderate. Runoff is medium to rapid. Water penetrates the fractured siltstone and sandstone. These soils dry out rapidly in spring, and they are droughty in mid and late summer.

A moderate hazard of erosion is the major limitation to the use of this soil for cultivated crops. Also, in frequently cultivated areas, management practices are needed to maintain fertility, soil structure, and organic-matter content; however, under intensive management, this soil can be cultivated frequently.

This soil is suited to most field crops and to the hay and pasture plants commonly grown in the county. Fruit trees commonly are highly productive on this soil. Specialty crops are not common, but under intensive management they can be grown. Seeding hay and pasture plants that can withstand droughty conditions helps to increase the production of forage during dry periods.

CAPABILITY UNIT IIw–1

This unit consists of somewhat poorly drained, nearly level soils. These soils are on low-lying stream terraces and flood plains. They formed in loamy material. These soils are susceptible to flooding.

The soils in this unit have a deep to moderately deep rooting zone when the water table is low. The water

table is at or near the surface during winter and spring. The available water capacity is high. Permeability is moderate to moderately slow, and runoff is very slow.

These soils are subject to little or no erosion. Flooding and seasonal wetness are the major limitations to the use of these soils for farm crops. Also, they are susceptible to siltation and frost heaving. Surface crusting is common if these soils are cultivated, and they are damaged if they are tilled or pastured when too wet.

Because these soils are in low areas on the landscape, they commonly are difficult to drain. Tile and surface drains are generally needed for adequate drainage. Wetness can be reduced in some areas by diverting runoff from nearby higher land.

These soils are suited to summer row crops and adapted pasture plants in areas where flooding is infrequent and drainage is adequate. Adapted plants that provide food and cover for wildlife are suited to areas that cannot be drained. Flooding can damage winter grain. Plants such as alfalfa will heave severely on these soils. Controlling weeds is difficult in many places. Summer row crops can be grown continuously on these soils. Shallow rooted plants that can tolerate wetness are the most suitable ones for pasture.

CAPABILITY UNIT IIw-2

This unit consists of moderately well drained and well drained, nearly level soils. These soils are on flood plains. They formed in alluvium and have a surface layer of silt loam. These soils are susceptible to occasional flooding, especially in winter and spring.

The soils in this unit have a deep rooting zone that is generally slightly acid or neutral. The available water capacity is high. Permeability is moderate.

Flooding is the major limitation to the use of these soils for field crops and pasture. Some of the soils dry somewhat slowly in spring. These soils are susceptible to siltation and frost action. Surface crusting is common when these soils are cultivated.

Under intensive management, these soils can be cultivated continuously. In dry periods plants generally grow better on these soils than on most upland soils in the county, but weed control is likely to be more difficult. Diversion terraces or ditches constructed along the base of slopes adjacent to these soils help to intercept runoff from higher, nearby areas.

These soils are easily worked. They are commonly used for row crops and pasture. They are well suited to irrigation. Most areas of these soils are unsuitable for growing winter grain because flooding damage is common. Plants such as alfalfa will heave severely when grown on these soils.

CAPABILITY UNIT IIw-3

This unit consists mostly of somewhat poorly drained and moderately well drained, nearly level to gently sloping soils. Most of these soils are on uplands, but some are on terraces above the levels reached by most floods. The subsoil is mostly silty clay loam, but in places it is loam or sandy clay loam. Some of these soils are clayey in the lower part of the subsoil or have a fragipan in the lower part of the subsoil.

The soils in this unit have a moderately deep rooting zone. Available water capacity is moderate. Permeability commonly is slow in the lower part of the subsoil. The dense, compact soil restricts the downward movement of water and the penetration of roots. Runoff is slow to medium. Surface crusting is common in cultivated areas.

Seasonal wetness is the major limitation to farming these soils, but erosion is also a hazard on the gently sloping soils. Generally, the seasonal water table is at or near the surface in winter and spring. Artificial drainage is needed for most crops. Adequate drainage is commonly achieved by tiling. The nearly level soils and the gently sloping soils generally require different tile systems.

These soils are suited to all the crops commonly grown in the county if adequate drainage is provided. Most areas of these soils are suited to continuous cultivation under intensive management. Soils that have slopes of more than 4 percent should not be used for continuous row crops, because erosion is difficult to control. Some of these soils are in small areas on the landscape so that their use is similar to the adjacent soils. Pasture plants that are water tolerant can provide good summer forage in areas not artificially drained. Pasturing early in spring can damage the soil by compaction.

CAPABILITY UNIT IIw-4

This unit consists of somewhat poorly drained, nearly level to gently sloping soils. These soils are on stream terraces and on uplands that were formerly occupied by shallow glacial lakes. They commonly have a subsoil of silt loam, silty clay loam, loam, and sandy clay loam.

The soils in this unit have a moderately deep to deep rooting zone, except where limited by the seasonal high water table. The available water capacity is moderate to high. Permeability is moderately slow to moderately rapid.

Wetness is the major limitation to use of these soils for crops, but erosion is also a hazard on the gently sloping soils. Wetness and soil material that is soft and compressible when wet are major limitations of these soils for most nonfarm uses. The water table is at or near the surface in winter and spring, and artificial drainage is needed for the successful production of most crops. Tile drainage is generally effective, but some soil areas lack suitable natural outlets for tile. Installing diversions at the base of adjacent slopes and the use of shallow ditches are useful in removing surface water. Unless artificial drainage is provided, these soils dry out slowly in spring. The soils in this unit that have a surface layer of silt loam are more susceptible to surface crusting than those that have a surface layer of loam. The silt loams have a higher frost heave potential than the loams.

These soils are suited to and are used for various crops. They can be intensively cropped if drainage is adequate and if tilth, fertility, and organic-matter content are maintained. Hay and pasture crops are suited to artificial drainage, particularly when such crops as alfalfa are grown. Varieties of grasses and legumes that are tolerant of wetness grow better on these soils than nontolerant varieties. Management practices are needed to improve drainage and control erosion on the gentle sloping soils.

Undrained areas are too wet during winter and

spring for many crops. They can be used for those crops that mature late in summer, however, because the planting of these crops generally can be delayed until late in spring or early in summer.

CAPABILITY UNIT IIw-5

This unit consists of dark-colored, very poorly drained nearly level soils. Most areas of these soils are on stream terraces, but some areas are in upland depressions, which were at one time shallow lakes. These soils have a seasonal high water table for long periods in winter and spring, and they stay wet until early in summer unless they are artificially drained.

The soils in this unit have a deep or moderately deep rooting zone, except where the depth is restricted by the seasonal high water table. The available water capacity is high. Permeability is moderately slow to moderately rapid.

Wetness is the major limitation to use of these soils for crops. There is some deposition (silting) in areas susceptible to ponding. If the soils are pastured or worked when too wet, they become compacted and subsequently become cloddy. The content of organic matter is high; therefore, these soils are not susceptible or are only slightly susceptible to crusting. They have good structure throughout. Where outlets are available, they can easily be drained by installing tile. In some places diversion terraces can be used to reduce runoff from adjacent areas. These soils are subject to little or no erosion.

These soils are among the most productive in the county where drainage is adequate. Areas of these soils that are adequately drained are suited to all of the commonly grown field crops and to many specialty crops. They are also well suited to grasses and legumes that tolerate some wetness. Under improved management, they can be used for continuous crops. Undrained areas of these soils are generally too wet for cultivation and are only suited to pasture late in summer.

CAPABILITY UNIT IIw-6

This unit consists of dark-colored, very poorly drained, nearly level soils. These soils are in depressional areas in the eastern and southern parts of the county. They consist of both organic and mineral layers. Some of these soils have organic layers that range from 16 to 42 inches in thickness. Underlying this organic material are stratified mineral layers that range from fine sandy loam to light silty clay loam. Other soils in this unit have a surface layer of silt loam and a clayey subsoil that ranges from 16 to 40 inches in thickness. Organic material underlies the clayey subsoil.

These soils commonly have a high water table most of the year because their position on the landscape leaves poor natural outlets for drainage. If these soils are adequately drained, they have a moderately deep to deep rooting zone and are highly productive. Available water capacity is high and permeability is rapid to moderately slow.

These soils mainly need management that provides artificial drainage. Tile or open ditches, or both, generally are suitable drainage practices. Diversion ditches or waterways can be constructed to intercept the runoff from adjacent higher areas and to prevent temporary flooding. Applications of phosphorus and potash are generally needed for optimum production. Adding nitrogen fertilizer in areas where corn is grown has increased yields, especially on the silt loam. In addition to wetness, the mucks are susceptible to soil blowing during dry periods.

These soils are well suited to corn and soybeans. These crops grow well under proper management, but wheat and oats tend to lodge. Special crops grow well on these soils if they are drained.

CAPABILITY UNIT IIs-1

This unit consists of moderately well drained and well drained, nearly level soils. These soils are on outwash plains and terraces that are normally above flood stage. They have a surface layer of loam or silt loam and are relatively shallow to sand and gravel. The moderately well drained soils commonly have compact clayey or silty material at a depth of 5 feet or more. During wet periods, the upper sandy and gravelly parts of the moderately well drained soils can become saturated.

The soils in this unit have a moderately deep or deep rooting zone that is acid in unlimed areas. The available water capacity is low to moderate. Water moves through these soils at a moderately rapid rate.

Conserving moisture is the main concern in managing these soils, but practices also are needed for maintaining or improving fertility and organic-matter content. Returning large amounts of crop residue to the soil and maintaining fertility need to be stressed in the management of these soils. Seeding mixtures for hay and pasture should include drought-resistant plants. Plant nutrients are more easily leached from these soils than from the finer textured soils in the county.

All of these soils are easy to work. They warm up fairly early in spring, and crops on them respond well to good management. They are suited to the field crops and hay and pasture plants commonly grown in the county and to adapted special crops. Under intensive management, cultivated crops can be grown frequently. Because of droughtiness, crops that mature early grow better on these soils than crops that mature late in summer or early in fall. Crop growth is less than normal in dry periods. These soils are well suited to irrigation.

CAPABILITY UNIT IIIe-1

This unit consists of gently sloping and sloping, well drained and moderately well drained soils. These soils are on uplands throughout the county. They either are clayey in the lower part of the subsoil or have a loamy fragipan that restricts root penetration and air and water movement. A few of these soils are underlain by bedrock at a depth of 3½ to 5 feet. The surface layer is silt loam. Some of these soils are moderately eroded.

The soils in this unit have a moderately deep to deep rooting zone. Available water capacity is low to moderate. Permeability is moderate to slow. Runoff is medium on the gently sloping soils and rapid on the others.

The hazard of erosion is the main limitation to use of these soils for cultivated crops. The moderately eroded soils have a plow layer that is a mixture of the original

surface layer and the less fertile subsoil material. Because these eroded soils have lost part of their original surface layer, their natural fertility, organic-matter content, available water capacity, and effective rooting depth are lower than those of the slightly eroded soils in this unit; therefore, yields are lower on these moderately eroded soils. Many of the moderately eroded soils have short, irregular, complex slopes. Controlling further erosion on these eroded slopes is more difficult than on the longer, more uniform slopes. Management practices are needed to control erosion and to improve the available water capacity. Seep spots are common in some of these soils. These areas, however, generally can be drained by tile. Bedrock may interfere with installation of tile in some soils.

These soils are suited to most of the crops commonly grown in the county and to adapted hay and pasture plants. They are not well suited to specialty crops unless management is very intensive. Under intensive management to control erosion, cultivated crops can be grown frequently. Generally, less frequent cultivation is needed to prevent critical erosion of the moderately eroded soils. Intensive management for field crops includes the use of close-growing crops, grasses, and legumes in the rotation, thus returning large amounts of crop residue to the soil. In meadows and in pastures, erosion is controlled by maintaining an adequate plant cover.

CAPABILITY UNIT IIIe-2

This unit consists of sloping, well drained and moderately well drained soils. These soils are on stream terraces. They formed in loamy material over sand and gravel or in silty material. These loamy or silty soils are on landscapes that typically consist of short slopes that are either elongated or irregular in shape.

These soils have a moderately deep to deep rooting zone that is normally acid in unlimed areas. The available water capacity is high for the silty soils, but it ranges from low to moderate for soils that are underlain by sand and gravel. Permeability is moderately slow in the silty soils and moderately rapid in the other soils.

The moderately eroded soils in this unit have a plow layer that is partly subsoil material. Because available water capacity is low and natural fertility has been reduced as a result of erosion, these soils generally are less productive than the other soils in this unit.

A severe hazard of erosion is the major limitation to the use of the soils in this unit, but maintaining fertility, soil structure, and organic-matter content are also concerns in frequently cultivated areas. The surface layer of the silty soils is more susceptible to crusting than that of the loamy soils. The loamy and gravelly soils warm up and dry out in spring before the moderately well drained silty soils in this unit. During dry periods, however, droughtiness appears sooner in the loamy and gravelly soils. Random tile may be needed to drain some small, local, wet areas that are sometimes near the moderately well drained soils.

These soils are suited to all of the field crops, hay crops, and pasture plants commonly grown in the county. Under improved management, they can be cultivated frequently. But if improved management is not used, excessive erosion generally results. These soils are suited to the commonly grown specialty crops, but very intensive management is generally required if specialty crops are grown commercially. Because the more gravelly soils tend to be droughty, crops that mature early are better suited than crops that mature late in the growing season.

CAPABILITY UNIT IIIe-3

This unit consists of sloping, well drained soils on hillsides. They have a surface layer of silt loam and a subsoil mainly of silt loam. At a depth of 20 to 40 inches, these soils are underlain by sandstone bedrock. They have a friable surface layer that is easy to work. The subsoil has good structure and does not retard the growth of roots or the movement of water, but the underlying bedrock is a barrier to root growth.

These soils have a moderately deep rooting zone and moderate permeability. The available water capacity is low to moderate, depending on the depth to bedrock and the degree of erosion. There are periods in dry years when the moisture supply is not adequate for crops. Natural drainage is adequate, but some areas have a few small seep spots.

In the moderately eroded soils, material from the original surface layer was lost through erosion, and natural fertility was reduced. Their available water capacity is commonly low. The surface layer contains a higher percentage of rock fragments, and depth to bedrock is commonly less than 30 inches.

A severe hazard of erosion is the major limitation to use of these soils for crops. Under intensive management, however, these soils can be cultivated frequently.

These soils are suited to the field crops, hay crops, and pasture plants commonly grown in the county, and some of the small orchards in the county are on these soils. Because many areas of these soils are narrow and oblong in shape and less than 15 acres in size, their use is often governed by the use of the surrounding soils, which are less sloping and are in larger areas. For the same reason, special erosion control practices commonly are not applied to these small areas.

CAPABILITY UNIT IIIw-1

This unit consists of dark-colored, nearly level, very poorly drained soils that have a clayey subsoil. They formed in lakebed deposits or in glacial till. Typically, these soils are on broad flats or small basinlike areas that were former lakebeds or on the glaciated uplands, generally as narrow strips along intermittent drainageways or as small depressional areas at the heads of drainageways.

The soils in this unit have a moderately deep rooting zone and high available water capacity. Permeability is slow to very slow, and runoff is slow. Tilth depends on the conditions under which the soils are plowed. In adequately drained areas of these soils, optimum moisture content of the surface layer is generally reached late in spring or early in summer. Consequently, these soils are commonly plowed when they are too wet, causing structure to deteriorate. They are sticky and plastic when wet and have a tendency to shrink and crack when dry.

Wetness is the major concern in managing these soils. Water is at or near the surface in winter and for extended periods in spring. Ponding is common in

areas that serve as sluggish, intermittent drainageways for adjacent soils. A combination of tile and surface drainage is generally needed to satisfactorily drain these soils. In places, it is difficult to obtain suitable outlets for use in draining. The preparation of a suitable seedbed is commonly difficult in these soils because they are slow to warm up and dry in spring. The control of erosion is not a concern, because these soils are nearly level.

These soils are productive if drained and kept in good tilth. They are suited to most commonly grown field crops and are suited to continuous cultivation under intensive management. Frost heaving and lodging of small grain are common. These soils are suited to pasture, but care should be taken to avoid pasturing them when they are wet. Some specialty crops, such as sugar beets and tomatoes, can be grown on these soils.

CAPABILITY UNIT IIIw-2

This unit consists of nearly level, poorly drained soils. These soils are on glaciated uplands, stream bottoms, and terraces in basinlike or depressional areas that receive drainage water from the adjacent soils.

The soils in this unit have a deep rooting zone, except where restricted by the seasonal water table. The available water capacity is high to moderate. Some of these soils are seldom droughty because water seeps into the areas from the adjacent soils. Permeability is slow to moderate. These soils have a friable surface layer.

Wetness is a severe limitation to the use of these soils. The seasonal water table is high, and the soils are susceptible to ponding. Also, the alluvial soils in this unit are susceptible to stream flooding and are often dissected by old stream channels. Artificial drainage of the alluvial soils generally is not feasible. Both surface and subsurface drainage are required to adequately drain the other soils in this unit. Tile can be installed easily, but many areas lack outlets. All of these soils are highly susceptible to crusting, and they can be satisfactorily worked only within a narrow range of moisture content.

These soils are generally used for wetland pasture or as woodland in undrained areas that are normally too wet for cultivation. They are suited to field crops that can tolerate some wetness in areas that are adequately drained and protected from flooding. Lodging of small grain, however, caused by frost heaving is common. Under intensive management, these soils can be used frequently for cultivated crops. Under less intensive management, however, the soil structure is likely to deteriorate and the soils become less suitable for crops.

CAPABILITY UNIT IIIw-3

This unit consists of very poorly drained, dark-colored, organic soils that have a muck surface layer. These soils are in level and basinlike areas that are old filled lakes and ponds. They are mainly south of the Defiance Moraine, which roughly divides the county in half. The soils formed in organic deposits that are 16 to more than 52 inches thick.

If drained, the soils in this unit have a moderately deep rooting zone. The available water capacity is high to very high. Permeability is moderately rapid in the organic material and slow to very slow in the underlying mineral material.

Wetness is the major management concern in using these soils because the water table is at or near the surface most of the year. The construction and maintenance of an adequate drainage system is difficult, particularly if a controlled water level is desired. Pumping is needed in places to provide outlets. Tile or open ditches, or a combination of both, generally are suitable for drainage. Diversion ditches or waterways can be constructed to intercept the runoff from adjacent higher areas to prevent temporary flooding. The muck is highly susceptible to soil blowing when the surface layer is dry. Controlling weeds is a concern in cultivated areas. Fires are a hazard.

These soils are unsuitable for cultivated crops or pasture unless they are drained. They are well suited to many of the commonly grown field crops and specialty crops if they are drained, except for wheat and other cereal grains that are highly subject to lodging on organic soils. Areas of these soils that are partly drained are suited to adapted hay and pasture plants. Areas that are too wet for pasture are better suited to plants that provide food and cover for wildlife than to most other uses. Under intensive management, these soils can be used for continuously cultivated crops. They are suited to most crops grown in the county. Under average management, however, excessive losses from soil blowing or subsidence are common, or the drainage system may not be adequate.

CAPABILITY UNIT IIIw-4

This unit consists of nearly level and gently sloping, somewhat poorly drained soils. Some of these soils are in old lakebeds. Others are on till plains.

Generally the soils in this unit are friable and easy to work, but the silt loam surface layer is susceptible to crusting. The subsoil is mostly clayey. In the subsoil, the downward movement of water is restricted and the rooting zone generally is moderately deep. Runoff is slow in the nearly level soils. The available water capacity is moderate. Permeability is slow to very slow in the lower part of the subsoil and in the substratum.

The major limitation of these soils is excessive wetness. The seasonal water table is at or near the surface in winter and spring. Ponding is common. These soils are slow to warm up and dry out in spring. Drainage is necessary if optimum production is to be obtained from these soils. Where applicable, both surface and subsurface drainage are needed. Some areas of these soils have slopes steep enough so that erosion control is also needed. In dry years crops that mature in summer are likely to be damaged by drought.

If they are drained, these soils are suited to most of the commonly grown field crops and hay or pasture plants. Intensive management is needed if these soils are to be used frequently for cultivated crops. Only low yields can be expected from these soils if they are not drained. Working these soils when they are too wet or allowing the organic-matter content to be low will damage the structure of the surface layer and will lower crop production. Generally, specialty crops are

not well suited to these soils. Because the clayey subsoil restricts the development of roots and frost action commonly causes heaving, these soils are poorly suited to alfalfa and other deep-rooted crops. Soil compaction results if these soils are grazed when they are wet.

CAPABILITY UNIT IIIs-1

The only soil in this unit is Oshtemo sandy loam, 2 to 6 percent slopes. This soil is well drained. It is on glacial terraces. It is underlain by acid sand and gravel. The surface layer is friable and easy to work. No layers that restrict the movement of water or the growth of roots are within 60 inches of the surface.

This soil has a deep rooting zone and low available water capacity. Permeability is moderately rapid. This soil dries out and warms up early in spring. The lack of available water is a severe limitation and generally limits crop production. In both dry and average years, the water supply is inadequate for most crops.

The control of erosion is not a concern. Water enters the soil rapidly, and little of it runs off. Soil blowing is generally not a serious hazard. Blowing sand, however, sometimes damages young vegetable plants on this and adjacent soils. Strips of rye or other cover crops can be used to protect the young crops.

Most field crops are suited to this soil only in wet years or if they are irrigated, but winter grain crops and crops that mature before the start of the usual dry weather period are not well suited. Under intensive management, which includes irrigation, vegetables can be grown successfully. Also, large applications of fertilizer are commonly required for this soil because both the organic-matter content and the plant nutrient supply are low. Pastures can be grazed early in spring but do not hold up late in summer. Alfalfa and other deep-rooted, drought-resistant plants are good pasture plants.

CAPABILITY UNIT IVe-1

This unit consists of sloping, moderately well drained soils. These soils formed in moderately fine textured glacial till. They have a friable silt loam surface layer and a clayey subsoil. The subsoil is sticky and plastic when wet, but it hardens, shrinks, and cracks when it dries. Some of the soil areas are underlain by sandstone bedrock at a depth of 3½ to 5 feet.

The soils in this unit have a moderately deep rooting zone and a moderate to low available water capacity. Permeability is slow to very slow in the lower part of the subsoil and in the underlying material.

A severe hazard of erosion is the major limitation to the use of this soil for cultivated crops. Runoff is potentially high because of slow internal drainage. Some of the soil areas have an eroded surface layer, and the plow layer is now a mixture of subsoil material and the remaining original surface layer. This eroded plow layer becomes hard and cloddy as it dries out. Maintenance of fertility, soil structure, and organic-matter content is difficult if this soil is cultivated more than occasionally.

Most cropped areas of this soil are in fields dominated by more gently sloping soils. The size of the cropped area determines whether special erosion control practices are used. Generally, natural drainage is adequate, but there are seep spots in some of the soil areas that interfere with normal cultivation. Tiling is the common method used to drain these wet areas.

These soils are moderately suited to crops commonly grown in the county. Only under intensive management can row crops be grown occasionally. Cultivating or pasturing these soils when wet causes them to become cloddy and compacted. They are not suited to specialty crops. Adequate vegetative cover must be maintained on pastures and hayland to control erosion.

CAPABILITY UNIT IVe-2

This unit consists of well-drained, moderately steep to steep soils. These soils are underlain by sand and gravel or by loamy glacial till. Some of these soils have a gravelly surface layer.

The soils in this unit have a moderately deep rooting zone and a low to moderate available water capacity. Permeability is moderately slow to rapid. Runoff is rapid. The surface layer is friable and easy to work.

A very severe hazard of erosion limits the use of these soils for crops. These soils are moderately eroded, and the plow layer is a mixture of the material from the subsoil and the remaining original surface layer.

These soils are suited to the field crops commonly grown in the county. Crops that require cultivation should be grown only occasionally, because erosion is difficult to control. Cultivated crops can be grown only under intensive management. These soils are well suited to the commonly grown hay and pasture plants. An adequate cover of plants must be maintained in the pastures to protect the soils from erosion.

CAPABILITY UNIT IVe-3

This unit consists of moderately steep to steep, moderately well drained soils. These soils formed in glacial till. They have been eroded, and the plow layer is now a mixture of material from the subsoil and the remaining original surface layer. The plow layer is slightly sticky, becomes cloddy, and is susceptible to compaction if it is tilled or pastured when wet.

The soils in this unit have a moderately deep rooting zone. The available water capacity is moderate. Permeability is slow. Runoff is high.

The hazard of erosion is very severe if the soils are used for cultivated crops. Because these soils are already eroded, any additional soil loss greatly reduces crop production. Another hazard to the use of these soils is farming them together with the adjacent, less sloping soils. This is a common practice because many of the soils are in small areas on the landscape. Therefore, special effort is generally required to improve and maintain fertility, soil structure, and organic-matter content.

Other hazards are wetness and droughtiness. In some places wetness caused by seepage is a concern early in spring. Sufficient moisture for good plant growth is lacking during the summer dry periods, particularly on south- and southwest-facing slopes.

These soils are moderately well suited to the crops commonly grown in the county. Under intensive management, which includes practices for controlling erosion, a row crop can be grown occasionally. Close-growing crops, grasses, and legumes need to be kept on these soils most of the time. Alfalfa is better suited

to these soils than to the wetter soils of the county. Winter heaving, however, can be severe on these soils.

CAPABILITY UNIT IVe-4

The only soil in this unit is Loudonville silt loam, 12 to 25 percent slopes, moderately eroded. This soil is well drained and is underlain by sandstone or shale bedrock at a depth of 20 to 40 inches. The surface layer is friable and easy to work.

This soil has a moderately deep rooting zone and a moderate to low available water capacity. Permeability is moderate.

A very severe hazard of erosion limits the use of this soil for crops, but droughtiness is also a concern during dry periods. Practices are needed to increase the amount of moisture available to plants and to aid in the control of erosion. Crop residue needs to be returned to the soil.

Under intensive management, this Loudonville soil is suited to most crops commonly grown in the county and to adapted grasses and legumes grown for hay or pasture. Because of the hazard of erosion and the limited available water capacity, this soil is better suited to winter grain and close-growing forage crops than to row crops. Close-growing crops, grasses, and legumes need to be grown most of the time. Drought-resistant grasses and legumes need to be included in the seeding mixture. This soil is suited to fruit trees and woodland.

CAPABILITY UNIT IVw-1

The only soil in this unit is Canadice silty clay loam. This soil is nearly level and poorly drained and has a clayey subsoil. It is on terraces in low-lying areas that receive runoff from the adjacent soils.

This soil has a moderately deep rooting zone in drained areas and a shallow rooting zone in undrained areas. The available water capacity is moderate, and permeability is very slow. Ponding is common.

Wetness is a very severe hazard to crops because this soil is normally difficult to drain. It is poorly suited to tile drainage. Most areas generally can be improved by using ditches and by intercepting and diverting runoff from adjacent areas. Where this soil is artificially drained, the range of moisture content optimum for cultivation is very narrow. The surface layer generally is in poor tilth. Maintaining good soil structure is important.

Drained areas of this soil are suited to most farm crops commonly grown in the county. Under intensive management, cultivated crops can be grown at infrequent intervals. Grasses and legumes need to be grown frequently to provide enough crop residue to help maintain soil structure and tilth. The undrained areas of these soils are not well suited to farm crops, but they can be used to provide food and cover for certain species of wildlife. They can provide some late summer pasture, which consists of forage plants that tolerate soil wetness. Compaction results if these soils are pastured when wet.

CAPABILITY UNIT VIe-1

This unit consists of sloping to steep, moderately well drained soils. These soils are in the more rolling areas scattered throughout the northern and western parts of the county. Many of these soils are along the upland waterways, where the areas are oblong and the slopes are short.

The surface layer is silt loam or a mixture of silt loam and part of the clayey subsoil material. The soils in this unit have a moderately deep rooting zone and low to moderate available water capacity. Permeability is slow to very slow. Runoff is fairly rapid, mostly because of the slope but partly because percolation through the clayey subsoil is slow.

The hazard of erosion is very severe on these soils unless a protective cover of vegetation is maintained. The subsoil is sticky and plastic when wet. It hardens and cracks as it dries in summer. In some areas seep spots are common.

These soils generally are not suitable for cultivation. Many areas are not large enough to adequately make use of erosion control practices. The larger areas of these soils are mainly used for pasture or woodland. These soils are only moderately well suited to alfalfa and other legumes that have a taproot, but they are suited to grasses and other legumes commonly grown for hay or pasture. In some areas, winter heaving is severe on these soils.

CAPABILITY UNIT VIIe-1

This unit consists of well-drained, very steep soils. These soils are on the more rugged valley walls that have been cut in bedrock. In some places exposed bedrock makes up more than half of the soil area.

The soils in this unit have a moderately deep rooting zone and a low to very low available water capacity. Permeability is moderately rapid to very rapid.

Because of the very severe erosion hazard, the very steep slopes, and the areas of rock outcrop, these soils are not suitable for farming or permanent pasture. Most areas of these soils are in woodland. Some areas, however, are in pasture. The growth of pasture plants is slow in dry periods, and the pasture is easily damaged by overgrazing.

Management is needed that provides an adequate plant cover at all times. Adapted trees and other vegetation can be planted to help control erosion and to provide food and cover for wildlife. Some of these soils provide scenic overlooks and are useful as open spaces.

CAPABILITY UNIT VIIe-2

This unit consists of well drained and moderately well drained, very steep soils. These soils are on side slopes of valleys that are along the major waterways. These soils have variable characteristics; some are clayey, and others are loamy.

The soils in this unit have a moderately deep rooting zone and a low or moderate available water capacity. Permeability ranges from rapid to very slow in the lower part of the subsoil.

These soils generally are too steep for farming. Many are even too steep for permanent pasture. Both seeding and management practices are difficult for those areas being pastured. The use of machinery is hazardous. The soils are suited to woodland or to scenic open areas.

Estimated yields

Table 1 shows, for most soils in the county, the estimated average acre yields of principal crops. The

TABLE 1.—*Estimated average yields per acre of principal crops under two levels of management*

[Figures in columns A indicate yields under improved management; figures in colunms B indicate yields under optimum management. Absence of a yield figure indicates that the crop is not well suited to the soil or is not commonly grown or that the soil is in a complex with Urban land]

Soil	Corn		Oats		Wheat		Soybeans		Grass-legume hay	
	A	B	A	B	A	B	A	B	A	B
	Bu	*Bu*	*Bu*	*Bu*	*Bu*	*Bu*	*Bu*	*Bu*	*Tons*	*Tons*
Bennington silt loam, 0 to 2 percent slopes	66	94	38	70	28	40	22	34	2.0	3.6
Bennington silt loam, 2 to 6 percent slopes	68	96	40	74	30	42	24	36	2.0	3.6
Bennington-Tiro silt loams, 0 to 2 percent slopes	68	96	40	74	30	42	24	36	2.0	3.6
Berks silt loam, 25 to 70 percent slopes	—	—	—	—	—	—	—	—	—	—
Bogart loam, 0 to 2 percent slopes	74	106	50	78	32	48	26	38	3.2	4.2
Bogart loam, 2 to 6 percent slopes	74	106	50	76	32	46	26	36	3.2	4.2
Canadice silty clay loam	52	78	40	60	20	32	18	24	1.6	3.0
Caneadea silt loam, 0 to 2 percent slopes	56	80	46	74	24	36	20	28	2.0	3.6
Caneadea silt loam, 2 to 6 percent slopes	56	80	46	74	24	36	20	28	2.0	3.6
Canfield silt loam, 0 to 2 percent slopes	66	100	60	78	28	44	25	36	3.0	4.0
Canfield silt loam, 2 to 6 percent slopes	65	98	60	78	28	44	25	34	3.0	4.0
Canfield silt loam, 2 to 6 percent slopes, moderately eroded	62	88	56	72	24	40	24	30	2.3	3.8
Canfield silt loam, 6 to 12 percent slopes, moderately eroded	58	84	55	70	22	40	22	30	2.0	3.6
Canfield-Urban land complex, rolling	—	—	—	—	—	—	—	—	—	—
Cardington fine sandy loam, 2 to 6 percent slopes	66	92	52	74	30	44	20	34	3.0	4.0
Cardington silt loam 2 to 6 percent slopes	60	90	50	72	26	44	20	30	2.8	3.8
Cardington silt loam 6 to 12 percent slopes, moderately eroded	54	80	44	66	24	38	18	28	2.6	3.4
Cardington silt loam, 12 to 25 percent slopes, moderately eroded	—	—	40	62	20	30	16	24	2.0	3.0
Carlisle muck	80	120	—	—	—	—	32	40	3.8	4.8
Chagrin silt loam	80	116	50	74	28	40	26	38	2.5	4.6
Chili loam, 0 to 2 percent slopes	66	100	56	76	28	40	26	36	3.2	4.0
Chili loam, 2 to 6 percent slopes	60	96	54	74	26	38	24	34	3.0	3.8
Chili loam, 6 to 12 percent slopes	56	90	50	72	24	36	22	32	2.8	3.6
Chili gravelly loam, 6 to 12 percent slopes, moderately eroded	46	76	30	50	20	32	20	30	2.0	3.0
Chili gravelly loam, 12 to 25 percent slopes, moderately eroded	—	—	28	44	18	28	16	28	1.6	2.8
Chili gravelly loam, 25 to 70 percent slopes, moderately eroded	—	—	—	—	—	—	—	—	—	—
Chili silt loam, 0 to 2 percent slopes	72	104	60	80	30	44	26	38	3.6	4.4
Chili silt loam, 2 to 6 percent slopes	64	100	58	78	28	42	24	36	3.4	4.2
Chili silt loam, 6 to 12 percent slopes	56	90	54	74	26	36	22	34	3.2	4.0
Chili-Urban land complex, undulating	—	—	—	—	—	—	—	—	—	—
Condit silt loam	56	80	36	62	16	30	16	26	1.6	3.4
Ellsworth silt loam, 2 to 6 percent slopes	60	90	52	72	26	40	24	34	2.8	3.8
Ellsworth silt loam, 2 to 6 percent slopes, moderately eroded	52	82	46	66	22	36	20	30	2.6	3.6
Ellsworth silt loam, 6 to 12 percent slopes	54	82	48	70	22	38	22	32	2.6	3.6
Ellsworth silt loam, 6 to 12 percent slopes, moderately eroded	48	78	42	66	18	34	18	28	2.4	3.2
Ellsworth silt loam, 12 to 25 percent slopes, moderately eroded	—	—	40	58	16	30	16	26	2.0	3.0
Ellsworth silt loam, 25 to 70 percent slopes	—	—	—	—	—	—	—	—	—	—
Ellsworth silt loam, sandstone substratum, 2 to 6 percent slopes	60	80	52	72	26	40	24	34	2.8	3.8
Ellsworth silt loam, sandstone substratum, 6 to 12 percent slopes, moderately eroded	48	78	42	66	18	34	18	26	2.4	3.2
Ellsworth-Urban land complex, undulating	—	—	—	—	—	—	—	—	—	—
Fitchville silt loam, 0 to 2 percent slopes	70	98	48	72	22	38	22	34	2.6	4.0
Fitchville silt loam, 2 to 6 percent slopes	60	96	46	70	20	36	20	32	2.4	3.8
Fitchville silt loam, low terrace, 0 to 2 percent slopes	66	106	40	66	18	34	18	34	2.0	3.6
Geeburg silt loam, 6 to 18 percent slopes	—	—	—	—	—	—	—	—	1.8	3.0
Glenford silt loam, 0 to 2 percent slopes	78	106	58	80	28	42	28	36	3.0	4.0

TABLE 1.—*Estimated average yields per acre of principal crops under two levels of management*—Continued

Soil	Corn		Oats		Wheat		Soybeans		Grass-legume hay	
	A	B	A	B	A	B	A	B	A	B
Glenford silt loam, 2 to 6 percent slopes	76	100	56	78	26	40	24	34	3.0	4.0
Glenford silt loam, 6 to 12 percent slopes, moderately eroded	66	86	46	72	20	36	20	30	2.6	3.5
Haskins loam, 0 to 2 percent slopes	66	106	50	78	26	40	26	38	2.5	4.0
Haskins loam, 2 to 6 percent slopes	66	104	50	78	26	40	26	36	2.5	4.0
Holly silt loam	60	90	------	------	------	------	20	28	1.8	3.6
Jimtown loam, 0 to 2 percent slopes	70	104	50	76	26	38	26	38	2.4	4.0
Jimtown loam, 2 to 6 percent slopes	76	106	52	78	28	40	28	38	2.4	4.0
Jimtown-Urban land complex	------	------	------	------	------	------	------	------	------	------
Linwood muck	80	120	------	------	------	------	32	40	3.6	4.6
Lobdell silt loam	78	110	50	74	26	40	26	36	2.4	4.6
Lorain silty clay loam	76	116	56	78	30	42	30	42	3.0	4.8
Loudonville silt loam, 2 to 6 percent slopes	74	94	55	74	26	40	24	32	3.2	4.6
Loudonville silt loam, 6 to 12 percent slopes	70	88	52	72	26	38	22	30	3.2	4.4
Loudonville silt loam, 6 to 12 percent slopes, moderately eroded	66	84	46	68	24	36	18	26	2.6	3.8
Loudonville silt loam, 12 to 25 percent slopes, moderately eroded	------	------	28	50	18	30	16	24	2.4	3.0
Luray silt loam	76	110	52	76	30	42	30	42	3.6	5.0
Mahoning silt loam, 0 to 2 percent slopes	62	88	40	62	20	32	18	30	1.8	3.2
Mahoning silt loam, 2 to 6 percent slopes	62	90	42	64	22	34	20	32	2.0	3.4
Mahoning silt loam, sandstone substatum, 0 to 2 percent slopes	56	86	40	61	20	32	18	30	1.8	3.2
Mahoning silt loam, sandstone substatum, 2 to 6 percent slopes	56	88	42	64	22	34	20	32	2.0	3.4
Mahoning-Urban land complex, nearly level	------	------	------	------	------	------	------	------	------	------
Miner silty clay loam	70	100	50	76	28	42	26	40	3.0	4.8
Olmsted loam	80	116	56	78	30	46	26	40	3.4	5.0
Orrville silt loam	60	98	42	66	26	40	26	36	2.4	3.4
Orrville silt loam, bedrock substratum	58	96	42	66	26	38	26	36	2.4	3.4
Oshtemo sandy loam, 2 to 6 percent slopes	60	86	40	66	24	36	20	30	2.0	3.0
Ravenna silt loam, 0 to 2 percent slopes	62	92	46	76	22	36	22	36	2.4	3.4
Ravenna silt loam, 2 to 6 percent slopes	68	98	50	78	26	38	24	38	2.6	3.6
Ravenna-Urban land complex, nearly level	------	------	------	------	------	------	------	------	------	------
Rawson loam, 2 to 6 percent slopes	60	100	55	80	26	44	26	88	2.8	4.2
Rittman silt loam, 2 to 6 percent slopes	70	100	52	76	24	42	24	36	2.6	4.0
Rittman silt loam, 2 to 6 percent slopes, moderately eroded	68	90	46	68	22	38	20	28	2.4	3.6
Rittman silt loam, 6 to 12 percent slopes	60	86	44	70	22	38	22	32	2.8	3.6
Rittman silt loam, 6 to 12 percent slopes, moderately eroded	54	78	40	64	18	32	18	26	2.4	3.2
Rittman silt loam, 12 to 25 percent slopes, moderately eroded	48	74	36	60	16	30	14	24	1.8	2.8
Rittman silt loam, 25 to 70 percent slopes	------	------	------	------	------	------	------	------	------	------
Schaffenaker loamy sand, 25 to 70 percent slopes	------	------	------	------	------	------	------	------	------	------
Sebring silt loam	56	90	38	64	20	32	14	32	1.6	3.4
Sebring silt loam, till substratum	50	85	38	64	20	32	14	32	1.6	3.4
Wadsworth silt loam, 0 to 2 percent slopes	58	94	44	70	20	30	20	32	2.2	3.4
Wadsworth silt loam, 2 to 6 percent slopes	62	96	48	74	24	32	24	36	2.4	3.6
Wadsworth-Urban land complex, undulating	------	------	------	------	------	------	------	------	------	------
Wallkill silt loam	76	116	46	74	20	42	25	40	2.4	4.4
Willette muck	70	110	------	------	------	------	26	38	3.6	4.6
Wooster silt loam, 2 to 6 percent slopes	76	106	60	80	30	44	28	38	3.4	4.4
Wooster silt loam, 2 to 6 percent slopes, moderately eroded	68	94	54	76	26	40	24	32	2.8	4.2
Wooster silt loam, 6 to 12 percent slopes, moderately eroded	66	88	40	72	22	36	21	30	2.6	4.0
Wooster silt loam, 12 to 25 percent slopes, moderately eroded	------	------	36	68	18	32	------	------	2.2	3.6
Wooster silt loam, 25 to 70 percent slopes	------	------	------	------	------	------	------	------	------	------

yields are the averages of those expected over a period of years under two levels of management, improved and optimum. Yields are not estimated for soil complexes that include Urban land. These mapping units are not generally used for farming.

In table 1, yields in columns A are those obtained under improved management and those in columns B are obtained under optimum management. An optimum level of management includes: (1) practices that increase the intake of water and the water-holding capacity of the soils; (2) the disposal of excess water by appropriate means; (3) practices that help to control erosion; (4) suitable methods of plowing, preparing the seedbed, and cultivating; (5) controlling weeds, diseases, and insects; (6) maintaining fertility and reaction at an optimum level; (7) applying the trace elements, such as zinc, cobalt, manganese, and copper, if they are needed; (8) selecting high-yielding crop varieties suited to the soil; and (9) conducting all farming operations at the proper time and in the proper way.

In an improved level of management the farmer uses some, but not all, of the practices listed under optimum management, or the practices used are not adequate for the needs of crops.

The yields given in table 1 do not apply to a specific field for any particular year because the soils vary from place to place, management practices vary from farm to farm, and weather conditions are variable from year to year. These yields are intended only as a general guide that shows the relative productivity of the soils, the response of the soils to management, and the relationship of the soils to each other. Although the general level of crop yields may change as new methods and new crop varieties are developed, the relative response of the different soils is not likely to change.

Pasture yields in cow-acre-days are not given in table 1. These yields, however, can be determined by multiplying the tons of grass-legume hay by 2,000 to convert tons to pounds and then by dividing the number of pounds by 40 to determine cow-acre-days. For example, Luray silt loam yields 5 tons of alfalfa-grass hay per acre under optimum management; 5 times 2,000 equals 10,000, and that divided by 40 equals 250, which is the estimated average number of days per year that one cow can graze an acre of Luray silt loam without damage to the pasture.

The estimates of yields given in table 1 are based primarily on information obtained from farmers and on observations and field trials made by the county agent and by the district conservationists of the Soil Conservation Service. They are also based on experiments made by the Ohio Agricultural Research and Development Center and on field observations made by members of the soil survey team.

Special crops

Special crops grown for commercial use in Medina County include vegetables, small fruits, tree fruits, and nursery plants. Irish potatoes are grown in the muck areas south of Lodi. Smaller areas throughout the county are used for sweet corn, tomatoes, peppers, melons, strawberries, and other vegetables and small fruits. Apples are the most important tree fruit grown in the county. Greenhouse-grown tomatoes and flowers are also an important enterprise in the county.

In this county the Glenford, Bogart, Chili, Rawson, Canfield, Cardington, Rittman, Wooster, and Loudonville soils that are nearly level to gently sloping are well suited to vegetables and small fruits. These soils have moderately good to good natural drainage; they warm up fairly early in spring; and if moisture is favorable throughout the growing season, crops grown on them can generally be harvested earlier than crops grown on the other soils. Managing and harvesting special crops on these soils are difficult in some local areas because slopes and soil patterns are complex. If the muck soils are adequately drained, they are suited to radishes, onions, lettuce, and other vegetable crops.

Many of the well drained and moderately well drained soils in the county have properties that make them suitable for orchards and nursery plants. Soils that are frequently susceptible to frost, however, should not be used for early vegetables, small fruits, and orchards.

Suggestions for growing special crops are not given in this survey, but the latest and most complete information can be obtained from the Ohio Cooperative Extension Service or the Soil Conservation Service.

Irrigation

Medina County usually receives sufficient rainfall for most crops, but there are periods when rainfall is below optimum. During these dry periods supplemental irrigation would benefit crops and pasture. Irrigation is particularly beneficial in years when rainfall is less than normal. At present, only a small acreage is irrigated in Medina County. These irrigated areas are mainly organic soils, which are used for both crops and turf. Also, most of the golf courses in the county have a sprinkler irrigation system.

For a soil to be suitable for sprinkler irrigation, it needs a porous surface layer and a deep rooting zone, and it must be easily maintained in good tilth. Also, the water and air in the subsoil or underlying material need to be able to move freely to prevent waterlogging. Slopes need to be level or gently sloping.

The Bogart, Chili, Oshtemo, and Rawson soils on outwash plains that have slopes of less than 6 percent are well suited to irrigation where crops or turf are grown. These soils dry out quickly and warm up early in spring, but they have limited available water capacity and are likely to have insufficient moisture during the growing season when rainfall is below optimum. The Canfield, Glenford, Loudonville, Rittman, and Wooster soils on uplands are suitable for limited irrigation where their slopes are less than 6 percent. The Chagrin and Lobdell soils on first bottoms are suited to irrigation. These soils have a high available water capacity and are susceptible to flooding.

Soils that can be used for irrigation, if artificial drainage is adequate, are Carlisle, Fitchville, Haskins, Jimtown, Linwood, Olmsted, Orrville, Ravenna, and Willette soils.

Crop yields on many soils in Medina County can be improved by irrigation during critical rainfall periods. Soil characteristics should be studied carefully before an irrigation system is installed. Some adverse soil characteristics include excessive slope, slow water in-

take rate, surface crusting, limited ability to store available water, flooding hazard, or somewhat poor, poor, or very poor natural drainage.

In addition to an evaluation of the soil, a qualified engineer should carefully evaluate the water supply, the crop or crops to be irrigated, the cost of equipment, and the economy of the operation. Additional information on irrrigation is available from the Ohio Cooperative Extension Service or the Soil Conservation Service.

Woodland

Originally, nearly all of Medina County was covered by mixed hardwood forest. Most of the forest has now been cleared. In 1967, according to the Ohio Soil and Water Conservation Needs Inventory (*9*),[3] woodland made up 41,814 acres, or about 15 percent of the total land area.

At present most of the woodland is in small farm woodlots. These are mainly on soils that are not well suited to farming. For example, about 14 percent of the woodland is on the flood plains; about 50 percent is on wet, nearly level to gently sloping uplands and terraces that have gently sloping to moderately steep slopes; and about 11 percent is on very steep uplands.

The soils of Medina County have been placed in woodland suitability groups to assist owners in planning the use of their soils for wood crops. The woodland suitability groups are shown in table 2. Each group is made up of soils that are suited to the same kinds of trees, that need the same management where the vegetation on them is similar, and that have the same potential production.

Each woodland group is identified by a three-part symbol, such as 1o1, 2w3, or 3w1. The potential productivity of the soils in the group is indicated by the first number in the symbol: 1, excellent; 2, good; 3, fair; and 4, poor. These ratings are based on field determination of average site index. Site index of a given soil is the height, in feet, that the taller trees of a given species reach in a natural, essentially unmanaged stand in 50 years. Site index can be converted into approximate expected growth and yield per acre in cords and board feet (*4*, *7*, *8*, and *12*).

The potential productivity is given in table 2 for selected tree species. Both the estimated site index and the adjective rating, based on site index, are given.

The second part of the symbol identifying a woodland group is a small letter. In this survey *w*, *s*, *f*, *r*, and *o* are used. Except for the *o*, the small letter indicates an important soil property that imposes a hazard or limitation in managing the soils of the group for trees. The letter *o* indicates that the soils have few limitations that restrict their use for trees. The letter *w* indicates excessive wetness, either seasonal or all year. The soils have restricted drainage, have high water tables, or are susceptible to flooding. The letter *s* indicates sandy soils that have little or no difference in texture between surface layer and subsoil (B horizon). These soils are moderately restricted to severely restricted for woodland use. They have low available water capacity and are low in available plant nutrients. The letter *f* indicates limitations because of a large amount of gravel, cobbles, or other coarse rock fragments less than 10 inches in size. The letter *r* indicates that the main limitation is steep slopes and that there is hazard of erosion and possibly limitations to use of equipment. In this county *r* is used if slopes are greater than 12 percent.

The last part of the symbol, another number, differentiates woodland suitability groups that have identical first and second parts in their identifying symbol. Soils in woodland group 2w1, for example, require somewhat different management from soils in group 2w2.

In table 2 each woodland suitability group in the county is rated for various management hazards or limitations. These ratings are slight, moderate, or severe, and they are described in the following paragraphs.

Erosion hazard is *slight* if problems of erosion control are unimportant; *moderate* if some attention must be given to prevent unnecessary erosion; *severe* if intensive treatments, specialized equipment, and specific methods of operation must be used to minimize soil deterioration.

Equipment limitations depend on soil characteristics that restrict or prohibit the use of harvesting equipment, either seasonally or continually. *Slight* means no restrictions in the kind of equipment or time of year it is used; *moderate* means that use of equipment is restricted for 3 months of the year or less; *severe* means that special equipment is needed and that its use is severely restricted for more than 3 months of the year.

Seedling mortality refers to mortality of naturally occurring or planted tree seedlings, as influenced by kinds of soil or topographic conditions when plant competition is assumed not to be a factor and seed supplies are assumed to be adequate. *Slight* means a loss of 0 to 25 percent; *moderate* means a loss of 25 to 50 percent; and *severe* means a loss of more than 50 percent of the seedlings.

Plant competition is the degree to which undesirable plants invade openings in the tree canopy. Conifers and hardwoods are rated separately in table 2. *Slight* means that plant competition does not prevent adequate natural regeneration and early growth or interfere with seedling development; *moderate* means that competition delays natural or artificial establishment and growth rate but does not prevent the development of fully stocked normal stands; *severe* means that competition prevents adequate natural or artificial regeneration unless the site is prepared properly and proper maintenance practices are used.

Windthrow hazard depends on the soil characteristics that enable trees to resist being blown down by the wind. *Slight* means that most trees withstand the wind; *moderate* means that some trees are expected to blow down during excessive wetness and high wind; *severe* means that many trees are expected to blow down during periods when the soil is wet and winds are moderate to high.

Table 2 lists suitable species to favor in existing stands and suitable species for planting.

The woodland suitability group to which each soil is assigned is given in the "Guide to Mapping Units"

[3] Italic numbers in parentheses refer to Literature Cited, p. 116.

at the back of this survey and at the end of the description of that soil in the section, "Descriptions of the Soils."

Wildlife

Wildlife is an important natural resource in Medina County. Among the principal kinds of game are ring-necked pheasants, cottontail rabbits, quail, squirrel, white-tailed deer, opossum, striped skunk, fox, raccoon, muskrat, mink, and waterfowl. There are also many kinds of songbirds, birds of prey, reptiles, amphibians, and small mammals. The Hinckley Ledges in Hinckley Township is a prominent turkey buzzard nesting area.

The survival and extent of any kind of wildlife species depend on the presence and distribution of water and of plants that provide food and cover. If any of these habitat elements is lacking or inadequate, desired wildlife will be absent or scarce. The kinds of wildlife that live in a given area and the number of each kind are closely related to land use, the resulting kinds and patterns of vegetation, and the kinds and distribution of water. These, in turn, are generally related to the kinds of soils.

Most wildlife habitat is created or improved by planting suitable vegetation or manipulating existing vegetation so as to increase or improve desirable plants, or by a combination of these measures. For this management, a knowledge of the soils is needed so that the growth of plants suitable for wildlife can be estimated. Water areas also can be established or improved for wetland wildlife. Specific information about managing wildlife areas can be obtained from the local game protector, an agent of the Cooperative Extension Service, or a representative of the Soil Conservation Service.

Elements of habitat and kinds of wildlife

In table 3 most of the soils of Medina County are rated according to suitability for seven elements of wildlife habitat and for three broad classes of wildlife. More detailed information about the rating system is given in a paper by Allan, Garland, and Dugan (*1*).

Information in this section can be used to aid in—

1. Broad-scale planning for wildlife land use, such as in parks, wildlife refuges, nature-study areas, and other recreational developments;
2. Selecting the better soil sites for creating, improving, or maintaining specific kinds of wildlife habitat elements;
3. Determining the relative degree of management intensity required for individual habitat elements;
4. Eliminating sites on which management for specific kinds of wildlife is difficult or not feasible; and
5. Determining areas suitable for acquisition for wildlife use.

Each soil is rated in table 3 according to its suitability for various kinds of plants and other elements that make up wildlife habitat. Not considered in the ratings are present land use, the location of a soil in relation to other soils, and the mobility of wildlife. All the soils are rated on the basis of their natural drainage class. Artificial drainage can change the ratings indicated.

The seven elements of wildlife habitat for which the soils are rated in table 3 are briefly described in the following paragraphs.

Grain and seed crops.—These crops include such seed-producing annuals as corn, sorghum, wheat, barley, rye, oats, millet, sunflowers, and other plants commonly grown for grain or for seed. The major soil properties affecting this habitat element are effective rooting depth, available water capacity, natural drainage, slope, surface stoniness, hazard of flooding, and texture of the surface layer.

Grasses and legumes.—Making up this group are domestic perennial grasses and herbaceous legumes that are established by planting and that furnish wildlife food and cover. Among the plants are bluegrass, fescue, bromegrass, timothy, orchardgrass, reed canarygrass, clover, and alfalfa. The major soil properties affecting this habitat element are effective rooting depth, available water capacity, natural drainage, slope, surface stoniness, hazard of flooding, and texture of the surface layer.

Wild herbaceous plants.—In this group are native or introduced perennial grasses and weeds that generally are established naturally. They include bluestem, foxtail, ragweed, wild rye, goldenrod, wild carrot, nightshade, dandelion, and native lespedeza. They provide food and cover principally to upland forms of wildlife. The major soil properties affecting this habitat element are effective rooting depth, available water capacity, natural drainage, surface stoniness, hazard of flooding or ponding, and texture of the surface layer.

Hardwood trees.—This element includes nonconiferous trees, shrubs, and woody vines that produce nuts or other fruits, buds, catkins, twigs, or foliage that wildlife eat. They are generally established naturally but may be planted. Among the native kinds are oak, cherry, maple, hackberry, apple, hawthorn, dogwood, persimmon, sumac, sassafras, hazelnut, black walnut, hickory, sweetgum, huckleberry, blackhaw, vibernum, grape, and briers. The major soil properties affecting this habitat element are effective rooting depth, available water capacity, and natural drainage.

Also in this group are several varieties of fruiting shrubs that are raised commercially for planting. Autumn-olive, Amur honeysuckle, Tatarian honeysuckle, crabapple, muliflora rose, highbush cranberry, and silky cornel dogwood are some of the shrubs that generally are available and can be planted on soils that are rated good. Hardwoods that are not available commercially can commonly be transplanted successfully.

Coniferous plants.—This element consists of cone-bearing evergreen trees and shrubs that are used by wildlife primarily as cover, but they also provide browse and seeds of fruitlike cones. Among them are Norway spruce, Virginia pine, shortleaf pine, Scotch pine, and eastern redcedar. The major soil properties affecting this habitat element are effective rooting depth, available water capacity, and natural drainage.

Wetland plants.—Making up this group are wild, herbaceous, and annual and perennial plants that grow

TABLE 2.—*Potential productivity, limitations in management, and*

[The soil-Urban land complexes CeC, CuB, Eub, Ju, MnA, RnA, and WbB are not

Woodland suitability group, soil series, and map symbols	Potential productivity			Erosion hazard	Equipment limitations
	Species	Estimated site index	Adjective rating		
Group 1o1: Canfield: CdA, CdB, CdB2, CdC2. Chagrin: Cm. Glenford: GfA, GfB, GfC2. Lobdell: Le. Rittman: RsB, RsB2, RsC, RsC2. Wooster: WuB, WuB2, WuC2.	Upland oaks Yellow-poplar Sugar maple	85+ 95+ 85+	Excellent	Slight	Slight
Group 1r1: Rittman: RsE2. Wooster: WuE2.	Upland oaks	85+	Excellent	Moderate	Moderate
Group 1r2: Rittman: RsF. Wooster: WuF.	Upland oaks	85+	Excellent	Severe	Severe
Group 2c1: Geeburg: GbC.	Upland oaks	75–85	Good	Slight	Moderate
Group 2o1: Bogart: BtA, BtB. Cardington: CfB, CgB, CgC2. Chili: CnA, CnB, CnC, CoC2, CpA, CpB, CpC. Loudonville: LoB, LoC, LoC2. Rawson: RoB.	Upland oaks	75–85	Good	Slight	Slight
Group 2r1: Cardington: CgE2. Chili: CoE2. Loudonville: LoE2.	Upland oaks	75–85	Good	Moderate	Moderate
Group 2r2: Chili: CoF2.	Upland oaks	75–85	Good	Severe	Severe
Group 2w1: Holly: Hy. Lorain: Ln. Luray: Ly. Miner: Mr. Olmsted: Od. Wallkill: Wc.	Pin oak	80–90	Good	Slight	Severe
Group 2w2: Canadice: Ca. Condit: Cy. Sebring: Sg, St.	Pin oak Upland oaks Yellow-poplar Sugar maple Eastern white pine.	80–90 75–85 85–95 75–85 85–95	Good	Slight	Severe

favored species of wood crops by woodland suitability groups

assigned to woodland suitability groups and are not therefore rated in this table]

Seedling mortality	Plant competition		Windthrow hazard	Species favored—	
	Conifers	Hardwoods		In existing stands	For planting
Slight	Severe	Moderate	Slight	Yellow-poplar, black walnut, northern red oak, white oak, black oak.	Eastern white pine, yellow-poplar, black walnut, Norway spruce.
Slight	Severe	Moderate	Slight	Yellow-poplar, northern red oak, black oak, white oak, black walnut.	Eastern white pine, yellow-poplar, black walnut.
Slight	Severe	Moderate	Slight	Yellow-poplar, northern red oak, black oak, white oak, black walnut.	Eastern white pine, yellow-poplar, black walnut.
Slight	Severe	Moderate	Slight	Yellow-poplar, black walnut, northern red oak, white oak, white ash.	Eastern white pine, yellow-poplar, black walnut.
Slight	Severe	Moderate	Slight	Yellow-poplar, black walnut, northern red oak, white oak.	Eastern white pine, black walnut, yellow-poplar.
Slight	Severe	Moderate	Slight	Yellow-poplar, black walnut, northern red oak, white oak.	Eastern white pine, black walnut, yellow-poplar.
Slight	Severe	Moderate	Slight	Yellow-poplar, black walnut, northern red oak, white oak.	Eastern white pine, yellow-poplar.
Severe	Severe	Moderate	Severe	Pin oak, white ash, red maple, black oak.	([1])
Moderate	Severe	Moderate	Moderate	Yellow-poplar, northern red oak, black oak, white ash, sugar maple, red maple.	Eastern white pine, yellow-poplar.

TABLE 2.—*Potential productivity, limitations in management, and*

Woodland suitability group, soil series, and map symbols	Potential productivity			Erosion hazard	Equipment limitations
	Species	Estimated site index	Adjective rating		
Group 2w3: Bennington: BnA, BnB, BoA. Caneadea: CcA, CcB. Fitchville: FcA, FcB, FlA. Haskins: HsA, HsB. Jimtown: JtA, JtB. Mahoning: MgA, MgB, MlA, MlB. Orrville: Or, Os.	Pin oak Upland oaks Yellow-poplar Sugar maple Eastern white pine.	80–90 75–85 85–95 75–85 85–95	Good	Slight	Moderate
Group 2w4: Ravenna: ReA, ReB. Wadsworth: WaA, WaB.	Pin oak Upland oaks Yellow-poplar Sugar maple Eastern white pine.	80–90 75–85 85–95 75–85 85–95	Good	Slight	Moderate
Group 3o1: Ellsworth: ElB, ElB2, ElC, ElC2, EsB, EsC2.	Upland oaks Yellow-poplar Eastern white pine.	65–75 75–85 75–85	Fair	Slight	Slight
Group 3r1: Ellsworth: ElE2.	Upland oaks	65–75	Fair	Moderate	Moderate
Group 3r2: Ellsworth: ElF.	Upland oaks	65–75	Fair	Severe	Severe
Group 3s1: Oshtemo: OtB.	Upland oaks	65–75	Fair	Slight	Slight
Group 4f1: Berks: BrF.	Upland oaks	55–65	Poor	Severe	Severe
Group 4r1: Schaffenaker: ScF.	Upland oaks	55–65	Poor	Severe	Severe
Group 5w1. Carlisle: Ch. Linwood: Ld. Willette: Wt. Not suited to the commercial production of trees.					

[1] Allow natural reseeding.

on moist to wet sites exclusive of submerged or floating aquatics. They produce food and cover used mainly by wetland forms of wildlife. They include smartweed, wild millet, bulrush, sedges, barnyard grass, pondweed, duckweed, arrow-arum, pickeralweed, waterwillow, wetland grasses, and cattails. The major soil properties affecting this habitat element are natural drainage, surface stoniness, slope, and texture of the surface layer.

Shallow-water areas.—These are areas of shallow water, generally not exceeding 5 feet in depth, near food and cover for wetland wildlife. They may be natural wet areas, or they may be created by dams or levees or by water-control devices in marshes or streams. Examples of such developments are wildlife ponds, beaver ponds, muskrat marshes, waterfowl feeding areas, and wildlife watering developments. The major soil properties affecting this habitat element are depth to bedrock, natural drainage, slope, surface stoniness, and permeability. Natural wet areas that are aquifer fed are rated on the basis of drainage class without regard to permeability. Permeability of

favored species of wood crops by woodland suitability groups—Continued

Seedling mortality	Plant competition		Windthrow hazard	Species favored—	
	Conifers	Hardwoods		In existing stands	For planting
Slight	Severe	Moderate	Slight	Yellow-poplar, northern red oak, black oak, white ash, sugar maple, red maple.	Eastern white pine, yellow-poplar.
Moderate	Severe	Moderate	Moderate	Yellow-poplar, northern red oak, black oak, white ash, sugar maple, red maple.	Eastern white pine, yellow-poplar.
Slight	Moderate	Slight	Slight	Northern red oak, white oak, yellow-poplar, black walnut.	Eastern white pine, yellow-poplar.
Slight	Moderate	Slight	Slight	Northern red oak, white oak, yellow-poplar, black walnut.	Eastern white pine, yellow-poplar.
Slight	Moderate	Slight	Slight	Northern red oak, white oak, yellow-poplar.	Eastern white pine, yellow-poplar.
Moderate	Moderate	Slight	Slight	White oak, northern red oak, black oak.	Eastern white pine, red pine.
Moderate	Slight	Slight	Slight	White oak, northern red oak, chestnut oak.	Eastern white pine, red pine.
Moderate	Slight	Slight	Slight	White oak, northern red oak, chestnut oak.	Eastern white pine, red pine.

the soil would apply only to those nonaquifer areas with a potential for development, and water is assumed to be available offsite.

Table 3 also rates the soils according to their suitability for three general kinds of wildlife habitat in the county—open-land, woodland, and wetland wildlife.

Open-land wildlife.—Examples of open-land wildlife are bobwhite quail, ringneck pheasant, meadowlark, field sparrow, dove, cottontail rabbit, red fox, and woodchuck. These birds and mammals normally live in areas of crops, pasture, meadow, and lawns and in areas overgrown with grasses, herbs, shrubs, and vines. They are also found along the fence lines and borders associated with open land.

Woodland wildlife.—Among the birds and mammals that prefer woodland habitat are ruffed grouse; woodcock; thrush; vireo; scarlet tanager; red, gray, and fox squirrels; red and gray foxes; white-tailed deer; and raccoon. These animals obtain food and cover in stands of hardwoods, coniferous trees, or shrubs, or a mixture of these plants.

TABLE 3.—*Suitability of the soils for elements of wildlife habitat and kinds of wildlife*

[The soil-Urban land complexes CeC, CuB, Eub, Ju, MnA, RnA, and WbB are not rated in this table]

Soil series and map symbols	Elements of wildlife habitat							Kinds of wildlife		
	Grain and seed crops	Grass and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow-water areas	Open-land	Woodland	Wetland
Bennington:										
BnA	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
BnB	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
BoA	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Berks: BrF	Very poor	Poor	Fair	Poor	Poor	Very poor	Very poor	Poor	Poor	Very poor.
Bogart: BtA, BtB	Fair	Good	Good	Fair	Fair	Poor	Very poor	Good	Fair	Very poor.
Canadice: Ca	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Caneadea:										
CcA	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
CcB	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
Canfield:										
CdA	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
CdB, CdB2	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
CdC2	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
Cardington:										
CfB, CgB	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
CgC2	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
CgE2	Poor	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
Carlisle: Ch	Very poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Chagrin: Cm	Poor	Fair	Fair	Good	Good	Poor	Very poor	Fair	Good	Very poor.
Chili:										
CnA, CpA	Fair	Good	Good	Fair	Fair	Poor	Very poor	Good	Fair	Very poor.
CnB, CpB	Fair	Good	Good	Fair	Fair	Poor	Very poor	Good	Fair	Very poor.
CnC, CoC2, CpC	Fair	Good	Good	Fair	Fair	Very poor	Very poor	Good	Fair	Very poor.
CoE2	Poor	Fair	Good	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor.
CoF2	Very poor	Poor	Good	Fair	Fair	Very poor	Very poor	Poor	Fair	Very poor.
Condit: Cy	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.

TABLE 3.—*Suitability of the soils for elements of of wildlife habitat and kinds of wildlife*—Continued

Soil series and map symbols	Elements of wildlife habitat							Kinds of wildlife		
	Grain and seed crops	Grass and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow-water areas	Open-land	Woodland	Wetland
Ellsworth:										
ElB, ElB2, EsB	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
ElC, ElC2, EsC2	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
ElE2	Poor	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
ElF	Very poor	Poor	Good	Good	Good	Very poor	Very poor	Poor	Good	Very poor.
Fitchville:										
FcA, FlA	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
FcB	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
Geeburg: GbC	Fair	Good	Good	Fair	Fair	Very poor	Very poor	Good	Fair	Very poor.
Glenford:										
GfA	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
GfB	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
GfC2	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
Haskins:										
HsA	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
HsB	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
Holly: Hy	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Jimtown:										
JtA	Fair	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.
JtB	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
Linwood: Ld	Very poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Lobdell: Le	Poor	Fair	Fair	Good	Good	Poor	Poor	Fair	Good	Poor.
Lorain: Ln	Very poor	Poor	Fair	Poor	Poor	Good	Good	Poor	Poor	Good.
Loudonville:										
LoB	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
LoC, LoC2	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
LoE2	Poor	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
Luray: Ly	Very poor	Poor	Fair	Poor	Poor	Good	Good	Poor	Poor	Good.
Mahoning:										
MgA, MlA	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
MgB, MlB	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Miner: Mr	Very poor	Poor	Fair	Poor	Poor	Good	Good	Poor	Poor	Good.

TABLE 3.—*Suitability of the soils for elements of of wildlife habitat and kinds of wildlife*—Continued

Soil series and map symbols	Elements of wildlife habitat							Kinds of wildlife		
	Grain and seed crops	Grass and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow-water areas	Open-land	Woodland	Wetland
Olmsted: Od	Very poor	Poor	Fair	Poor	Poor	Good	Poor	Poor	Poor	Fair.
Orrville: Or, Os	Poor	Fair	Fair	Good	Good	Fair	Fair	Fair	Good	Fair.
Oshtemo: OtB	Fair	Good	Good	Fair	Fair	Very poor	Very poor	Good	Fair	Very poor.
Ravenna:										
ReA	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
ReB	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Rawson: RoB	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
Rittman:										
RsB, RsB2	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
RsC, RsC2	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
RsE2	Poor	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
RsF	Very poor	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
Schaffenaker:										
ScF	Very poor	Very poor	Good	Fair	Fair	Very poor	Very poor	Poor	Fair	Very poor.
Sebring: Sg, St	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Wadsworth:										
WaA	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
WaB	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
Wallkill: Wc	Very poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Willette: Wt	Very poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Wooster:										
WuB, WuB2	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
WuC2	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
WuE2	Poor	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
WuF	Very poor	Poor	Good	Good	Good	Very poor	Very poor	Poor	Good	Very poor.

Wetland wildlife.—Ducks, Canada geese, rails, herons, and muskrat are familiar examples of birds and mammals that normally live in wet areas, such as ponds, marshes, and swamps.

Each rating under "Kinds of wildlife" in table 3 is based on the ratings listed for the habitat elements in the first part of the table. For open-land wildlife the rating is based on the ratings shown for grain and seed crops, domestic grasses and legumes, wild herbaceous upland plants, and either hardwood woody plants or coniferous woody plants, whichever is more applicable. For wetland wildlife the rating is based on the ratings shown for wetland food and cover plants and shallow-water areas.

On soils rated *good,* habitat is generally easily created, improved, or maintained. There are few or no soil limitations in habitat management, and satisfactory results are well assured.

On soils rated *fair,* habitat generally can be created, improved, or maintained, but the soils have moderate limitations that affect the creation, improvement, or maintenance of the habitat. A moderate intensity of management and fairly frequent attention may be required to assure satisfactory results.

On soils rated *poor,* habitat can generally be created, improved, or maintained, but there are rather severe soil limitations. Habitat management may be difficult, expensive, and require intensive effort. Satisfactory results are questionable.

On soils rated *very poor,* it is impractical to create, improve, or maintain habitat because of the very severe soil limitations. Unsatisfactory results are probable.

Engineering Uses of the Soils[4]

This section is useful to those who need information about soils used as structural material or as foundation upon which structures are built. Among those who can benefit from this section are planning commissions, town and city managers, land developers, engineers, contractors, and farmers.

Among properties of soils highly important in engineering are permeability, strength, compaction characteristics, soil drainage condition, shrink-swell potential, grain size, plasticity, and soil reaction. Also important are depth to water table, depth to bedrock, and soil slope. These properties, in various degrees and combinations, affect construction and maintenance of roads, airports, pipelines, foundations for small buildings, irrigation systems, ponds and small dams, and systems for disposal of sewage and refuse.

Information in this section of the soil survey can be helpful to those who

1. Select potential residential, industrial, commercial, and recreational areas.
2. Evaluate alternate routes for roads, highways, pipelines, and underground cables.
3. Seek sources of gravel, sand, or clay.
4. Plan farm drainage systems, irrigation systems, ponds, terraces, and other structures for controlling water and conserving soil.
5. Correlate performances of structures already built with properties of the kinds of soil on which they are built, for the purpose of predicting performances of structures on the same or similar kinds of soils in other locations.
6. Predict the trafficability of soils for cross-country movement of vehicles and construction equipment.
7. Develop preliminary estimates pertinent to construction in a particular area.

Most of the information in this section is presented in tables 4, 5, and 6, which show, respectively, results of engineering laboratory tests on soil samples; several estimated soil properties significant in engineering; and interpretations for various engineering uses.

This information, along with the soil map and other parts of this publication, can be used to make interpretations in addition to those given in tables 6 and 7, and it also can be used to make other useful maps.

This information, however, does not eliminate the need for further investigations at sites selected for engineering works. Inspection of sites is needed because many delineated areas of a given soil mapping unit may contain small areas of other kinds of soil that have strongly contrasting properties and different suitabilities or limitations for soil engineering.

Some of the terms used in this soil survey have different meanings in soil science and in engineering. The Glossary defines many of these terms as they are commonly used in soil science.

Engineering soil classification systems

The two systems most commonly used in classifying samples of soils for engineering are the Unified system, used by the SCS engineers, Department of Defense, and others, and the AASHTO system, adopted by the American Association of State Highway and Transportation Officials.

In the Unified system (*2*) soils are classified according to particle-size distribution, plasticity, liquid limit, and organic-matter content. Soils are grouped in 15 classes. There are eight classes of coarse-grained soils, identified as GW, GP, GM, GC, SW, SP, SM, and SC; six classes of fine-grained soils, identified as ML, CL, OL, MH, CH, and OH; and one class of highly organic soils, identified as Pt. Soils on the borderline between two classes are designated by symbols for both classes; for example, CL–ML.

The AASHTO system (*3*) is used to classify soils according to those properties that affect use in highway construction and maintenance. In this system a soil is placed in one of seven basic groups ranging from A–1 through A–7 on the basis of grain-size distribution, liquid limit, and plasticity index. In group A–1 are gravelly soils of high bearing strength, or the best soils for subgrade (foundation). At the other extreme, in group A–7, are clay soils that have low strength when wet and that are the poorest soils for subgrade. Where laboratory data are available to justify a further breakdown, the A–1, A–2, and A–7 groups are divided as follows: A–1–a, A–1–b, A–2–4, A–2–5, A–2–6, A–2–7, A–7–5, and A–7–6. As additional refinement, the engineering value of a soil material can be indicated by a group index number. Group indexes

[4] THOMAS B. JONES, civil engineer, Soil Conservation Service, assisted in the preparation of this section.

range from 0 for the best material to 20 or more for the poorest. The AASHTO classification for tested soils, with group index numbers in parentheses, is shown in table 4; the estimated classification, without group index numbers, is given in table 5 for all soils mapped in the survey area.

Engineering test data

Table 4 contains engineering test data for some of the major soil series in Medina County. These tests were made to help evaluate the soils for engineering purposes. The engineering classifications given are based on data obtained by mechanical analyses and by tests to determine liquid limits and plastic limits. The mechanical analyses were made by combined sieve and hydrometer methods.

Compaction, or moisture-density, data are important in earthwork. If a soil material is compacted at successively higher moisture content, assuming that the compactive effort remains constant, the density of the compacted material increases until the *optimum moisture content* is reached. After that, density decreases with increase in moisture content. The highest dry density obtained in the compactive test is termed *maximum dry density*. As a rule, maximum strength of earthwork is obtained if the soil is compacted to the maximum dry density.

Tests to determine liquid limit and plastic limit measure the effect of water on the consistence of soil material. These terms are explained in the section "Soil properties significant in engineering."

Soil properties significant in engineering

Several estimated soil properties significant in engineering are given in table 5. These estimates are made of typical soil profiles, by layers sufficiently different to have different significance in soil engineering. The estimates are based on field observations made in the course of mapping, on test data for these and similar soils, and on experience with the same kinds of soil in other counties. Following are explanations of some of the columns in table 5.

Depth to seasonal high water table is distance from the surface of the soil to the highest level that ground water reaches in the soil in most years.

Depth to bedrock is distance from the surface of the soil to the upper surface of the rock layer.

Soil texture is described in table 5 in the standard terms used by the United States Department of Agriculture (USDA). These terms take into account relative percentages of sand, silt, and clay in soil material that is less than 2 millimeters in diameter. "Loam," for example, is soil material that contains 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the soil contains gravel or other particles coarser than sand, an appropriate modifier is added, as for example, "gravelly loamy sand." "Sand," "silt," "clay," and some of the other terms used in USDA textural classification are defined in the Glossary.

Permeability is that quality of a soil that enables it to transmit water or air. It is estimated on the basis of those soil characteristics observed in the field, particularly structure and texture. The estimates in table 5 do not take into account lateral seepage or such transient soil features as plowpans and surface crusts.

Available water capacity is the ability of soils to hold water for use by most plants. It is commonly defined as the difference between the amount of water in the soil at field capacity and the amount at the wilting point of most crop plants.

Reaction is the degree of acidity or alkalinity of a soil, expressed in pH values. The pH value and terms used to describe soil reaction are explained in the Glossary.

Liquid limit and plasticity index indicate the effect of water on the strength and consistence of soil material. As the moisture content of a clayey soil is increased from a dry state, the material changes from a semisolid to a plastic state. If the moisture content is further increased, the material changes from a plastic to a liquid state. The plastic limit is the moisture content at which the soil material changes from the semisolid to plastic state; and the liquid limit, from a plastic to a liquid state. The plasticity index is the numerical difference between the liquid limit and the plastic limit. It indicates the range of moisture content within which a soil material is plastic. Liquid limit and plasticity index are estimated in table 5, but in table 4 the data on liquid limit and plasticity index are based on tests of soil samples.

Shrink-swell potential is the relative change in volume to be expected of soil material with changes in moisture content; that is, the extent to which the soil shrinks as it dries out or swells when it gets wet. Extent of shrinking and swelling is influenced by the amount and kind of clay in the soil. Shrinking and swelling of soils cause much damage to building foundations, roads, and other structures. A *high* shrink-swell potential indicates a hazard to maintenance of structures built in, on, or with material having this rating.

Corrosivity, as used in table 5, pertains to potential soil-induced chemical action that dissolves or weakens uncoated steel or concrete. Rate of corrosion of uncoated steel is related to such soil properties as drainage, texture, total acidity, and electrical conductivity of the soil material. Ratings of soils for corrosivity for concrete are based mainly on soil texture and acidity. Installations that intersect soil boundaries or soil horizons are more susceptible to corrosion than installations entirely in one kind of soil or in one soil horizon. A corrosivity rating of *low* means that there is a low probability of soil-induced corrosion damage. A rating of *high* means that there is a high probability of damage, so that protective measures for steel and more resistant concrete should be used to avoid or minimize damage.

Engineering interpretations of the soils

The interpretations in table 6 are based on estimated engineering properties of soils shown in table 5, on test data for soils in this survey area and others nearby or adjoining, and on the experience of engineers and soil scientists with the soils of Medina County.

In table 6, ratings are used to summarize suitability of the soils for all listed purposes other than for highway location, reservoir areas, embankments, drainage of crops and pasture, irrigation, terraces or diversions, and grassed waterways. For these particular uses, table 6 lists those soil features not to be overlooked in planning installation and maintenance.

Following are explanations of some of the columns in table 6.

Winter grading is affected chiefly by soil features that are relevant to moving, mixing, and compacting soil in roadbuilding when temperatures are below freezing.

Soils most susceptible to damaging frost action are silt loam and fine sandy loam soils that are wet or saturated most of the winter. Such soils are rated *high*.

Topsoil is used for topdressing an area where vegetation is to be established and maintained. Suitability is affected mainly by ease of working and spreading the soil material, as for preparing a seedbed; natural fertility of the material; the response of plants when fertilizer is applied; and absence of substances toxic to plants. Texture of the soil material and its content of stone fragments affect suitability, but also considered in the ratings is damage that will result at the area from which topsoil is taken.

Sand and gravel are used in great quantities in many kinds of construction. The ratings in table 6 provide guidance about where to look for probable sources. A soil rated as *good* or *fair* generally has a layer of sand or gravel at least 3 feet thick, the top of which is within a depth of 6 feet. The ratings do not take into account thickness of overburden, location of the water table, or other factors that affect mining of the materials, and neither do they indicate quality of the deposit.

Road fill is soil material used in embankments for roads. The suitability ratings reflect (1) the predicted performance of soil after it has been placed in an embankment that has been properly compacted and provided with adequate drainage and (2) the relative ease of excavating the material at borrow areas.

Soil properties that most affect highway and road location are load-supporting capacity and stability of the subgrade and the workability and quantity of cut and fill material available. The AASHTO and Unified classifications of the soil material, and also the capacity. Wetness and flooding affect stability of the material. Slope, depth to hard rock, content of stones and rocks, and wetness affect ease of excavation and amount of cut and fill needed to reach an even grade.

Pond reservoir areas hold water behind a dam or embankment. Soils suitable for pond reservoir areas have low seepage, which is related to their permeability and depth to fractured or permeable bedrock or other permeable material.

Embankments require soil material resistant to seepage and piping and of favorable stability, shrink-swell potential, shear strength, and compactibility. Presence of stones or organic material in a soil are unfavorable factors.

Drainage of crops and pasture is affected by such soil properties as permeability, texture, and structure; depth to claypan, rock, or other layers that influence rate of water movement; depth to the water table; slope, stability in ditchbanks; susceptibility to stream overflow; and availability of outlets for drainage.

Irrigation of a soil is affected by such features as slope; susceptibility to stream overflow, water erosion, or soil blowing; soil texture; content of stones; depth of rooting zone; rate of water intake at the surface; permeability of soil layers below the surface layer and in fragipans or other layers that restrict movement of water; amount of water held available to plants; need for drainage; and depth to water table or bedrock.

Terraces and diversions are embankments, or ridges, constructed across the slope to intercept runoff and seepage so that it soaks into the soil or flows slowly to a prepared outlet. Features that affect suitability of a soil for terraces are uniformity and steepness of slope; depth to bedrock or other unfavorable material; presence of stones; permeability; and resistance to water erosion, soil slipping, and soil blowing. A soil suitable for these structures provides outlets for runoff and is not difficult to vegetate.

Waterway layout and construction are affected by such properties as texture, depth and erodibility of the soil material, presence of stones or rock outcrops, and the steepness of slopes. Other factors affecting waterways are seepage, natural soil drainage, available water capacity, susceptibility to siltation, and the ease of establishing and maintaining vegetation.

Town and Country Development

An increasingly large acreage of Medina County soils is being taken out of farming and used as residential, industrial, commercial, and recreational areas. Medina County is close to the rapidly expanding communities of Cleveland and Akron. This expansion has greatly affected land use in the northern and eastern parts of the county. Most of the county is used for crops, but there is a mixing of farm and nonfarm uses.

The expansion of nonfarm uses of land can remove many acres from farming use in a short period of time. Shopping centers can easily replace 50 to 100 acres of farmland. Freeways and superhighways can replace as much as 50 acres per mile. These uses permanently remove land from farming.

This section of the soil survey provides information on the properties of the soils and their effect on selected nonfarm uses of land. It can help community planners and industrial users of land, who generally look for areas that are least costly to develop and maintain. Development and maintenance costs are related to soil limitations. Land use planners can find other useful information on the soil maps and in other parts of this survey. Table 7 gives the estimated degree and kinds of limitation of soils for some selected land uses. From this information, alternative uses can be considered in long-range planning and zoning. Because extensive manipulation of the soil alters some of its natural properties, the ratings for some uses will no longer apply to areas that have undergone extensive cutting and filling.

The estimated degree of limitations of the soils for a specified land use are indicated as slight, moderate, and severe. A rating of *slight* indicates that the soil has no important limitation to the specified use. *Moderate* indicates that the soil has some limitations to the specified use. These limitations need to be recognized, but they can be overcome or corrected. A rating of *severe* indicates that the soil has serious limitations that are costly and difficult to overcome.

TABLE 4.—*Engineering*

Soil name, laboratory number, and location	Parent material	Report No.	Depth	Moisture[2] density	
				Maximum dry density	Optimum moisture
			In	*Lb/ft^3*	*Pct*
Bennington silt loam (MD–20): Westfield Township; about 0.74 mile east of Westfield Center, 1,200 feet north of Greenwich Road. (Modal)	Glacial till.	20387	0–9	------	------
		20389	11–17	------	------
		20390	17–28	115	15
		20391	28–38	------	------
		20392	38–48	117	14
Cardington silt loam (MD–19): Westfield Township; 0.57 mile east of Westfield Center, 1,125 feet north of Greenwich Road. (Modal)	Glacial till.	20379	8–12	------	------
		20380	12–17	------	------
		20381	17–28	112	16
		20382	28–32	------	------
		20383	32–40	------	------
		20384	40–50	117	14
		20386	60–75	------	------
Fitchville silt loam (MD–21): Montville Township; about 3,000 feet north of Fixler Road and Bear Swamp Road junction, about 900 feet west of Bear Swamp Road. (Modal)	Lacustrine silt and clay.	20396	9–11	------	------
		20398	15–23	112	16
		20399	23–30	------	------
		20400	30–38	------	------
		20401	38–50	------	------
		20402	50–70	119	13
Rittman silt loam (MD–18): Montville Township, T. 2 N., R. 14 W; 800 feet west of Poe Road and River Styx Road junction, and 200 feet south of Poe Road. (Modal)	Glacial till.	19521	0–5	------	------
		19522	5–9	------	------
		19523	9–14	------	------
		19524	14–21	101	21
		19525	21–33	------	------
		19526	33–42	112	16
		19527	42–60	114	13
		19528	60–80	118	14
Sebring silt loam, till substratum (MD–16): Guilford Township, R. 13 W; 2,300 feet west and 100 feet north of Rawiga and Yoder Road junction. (Modal)	Lacustrine silt and clay and glacial till.	19499	0–3	------	------
		19500	3–9	------	------
		19501	9–11	------	------
		19502	11–16	------	------
		19503	16–26	------	------
		19504	26–36	------	------
		19505	36–45	------	------
		19506	45–66	------	------
		19507	66–80	------	------

[1] All tests were performed by the Soil Physical Studies Laboratory, Ohio State University, except moisture density analyses of the Bennington, Cardington, and Fitchville soils which were determined in the Ohio Department of Highways Testing Laboratory.

[2] Based on AASHTO Designation T–99 (*3*).

[3] Mechanical analyses according to the AASHTO Designation T88 (*3*), except all material coarser than 2 millimeters in diameter was excluded from samples. Soils in this table that formed in glacial till commonly have 2 to 5 percent of material coarser

Following are explanations of the uses rated in table 7.

Cultivated crops.—The soils have been rated according to their limitations to use for cultivated crops only. The degree of limitation is based on slope and erosion hazard or on the ease or difficulty of obtaining artificial drainage. Farming is rated in this table in a comparative manner to aid land use planners when they consider whether or not farming is a sound land use.

Septic tank absorption fields.—Most of the soils in the county have some limitations for disposing of effluent from septic tanks. Such limitations include excessive slope, a seasonally high water table, restricted permeability, poor natural drainage, flooding, and limited depth to bedrock.

Flooding and a seasonal high water table prevent proper functioning of disposal fields for variable periods. All soils susceptible to flooding have been rated

test data [1]

Mechanical analysis [3]				Liquid limit	Plasticity index	AASHTO [4]	Unified [5]
Percentage passing sieve—			Percentage smaller than 0.005 millimeter				
No. 10 (2.0 mm)	No. 40 (0.42 mm)	No. 200 (0.074 mm)					
				Pct			
100	97	90	37	------	------	------	------
100	97	92	47	------	------	------	------
100	96	85	47	39	18	A-6(11)	CL
------	100	99	24	30	12	A-6(9)	CL
------	100	99	10	31	12	A-6(9)	CL
100	94	83	39	------	------	------	------
100	96	85	47	------	------	------	------
------	------	------	------	39	18	A-6(11)	CL
100	96	85	44	------	------		
100	95	84	42	33	15	A-6(10)	CL
100	95	84	39	29	13	A-6(9)	CL
------	100	97	29	31	13	A-6(9)	CL
------	100	99	67	------	------	------	------
100	96	86	41	37	20	A-6(12)	CL
------	------	------	------	34	16	A-6(10)	CL
------	100	100	74	31	16	A-6(10)	CL
------	100	100	79	26	10	A-4(8)	CL
------	100	100	76	24	11	A-6(8)	CL
100	96	87	29	------	------	------	------
100	96	88	27	------	------	------	------
100	98	93	37	34	12	A-6(9)	CL-ML
100	------	------	------	43	12	A-7(9)	ML
100	94	84	43	33	12	A-6(9)	CL
100	95	84	43	36	15	A-6(10)	CL
100	92	80	38	30	11	A-6(8)	CL
100	93	81	39	------	------	------	------
100	97	96	31	------	------	------	------
100	96	89	29	------	------	------	------
100	99	94	39	32	10	A-4(8)	CL-ML
100	98	95	41	------	------	------	------
100	97	91	39	38	14	A-6(10)	CL-ML
100	92	81	33	34	14	A-6(10)	CL
100	97	94	53	40	17	A-6(11)	CL
100	91	75	29	------	------	------	------
100	93	85	37	30	11	A-6(8)	CL

than 2 millimeters. Results by this procedure frequently may differ somewhat from results obtained by the soil survey procedure of the Soil Conservation Service (SCS). In the procedure used, the fine material was analyzed by the hydrometer method. In the SCS soil survey procedure, the fine material is analyzed by the pipette method. The mechanical analyses used in this table may not be suitable for use in naming textural classes for soil.

[4] Based on AASHTO Designation M 145-49 (*3*).

[5] Based on the Unified soil classification system (*2*).

severe. However, local flooding frequencies may be such that some of the soils could be rated moderate or slight if other soil properties are not limiting.

Many of the soils in the county have been rated severe because their permeability is moderately slow to very slow. The range of permeability in inches per hour of each soil in the county has been estimated and is shown in table 5. A severe limitation is imposed by a restrictive layer such as dense glacial till or bedrock that interferes with adequate filtration and the movement of effluent. Some soils, even though rated severe, are better than others similarly rated.

If filter beds for septic tanks are in areas where slopes are more than 12 percent, erosion and seepage downslope can be a concern, or the soil may become unstable when saturated.

Some soils in the county have a gravelly and sandy substratum, through which effluent that is inadequately

TABLE 5.—*Estimated soil properties*

[An asterisk in the first column indicates that at least one mapping unit in this series is made up of two or more kinds of soil. fully the instructions for referring to other series that appear in the first column

Soil series and map symbols	Depth to— Seasonal high water table	Depth to— Bedrock	Depth from surface	USDA texture	Classification: Unified	Classification: AASHTO	Coarse fraction greater than 3 inches	Percentage passing sieve— No. 4 (4.7 mm)	Percentage passing sieve— No. 10 (2.0 mm)
	Ft	*Ft*	*In*				*Pct*		
*Bennington: BnA, BnB, BoA. For Tiro part of BoA, see Tiro series.	½–1½	>6	0–11	Silt loam	ML, CL–ML	A–4, A–6	0	95–100	85–100
			11–28	Silty clay loam	CL	A–6	0	95–100	85–100
			28–60	Clay loam	CL, CL–ML	A–6	2	90–98	80–90
Berks: BrF	>3	1½–3	0–6	Silt loam	ML	A–4	3–8	80–95	80–90
			6–31	Channery silt loam.	ML, SM, or GM	A–4, A–2	20–50	40–80	30–60
			31	Siltstone bedrock.					
Bogart: BtA, BtB	1½–3	>6	0–9	Loam	ML	A–4	0	80–90	70–80
			9–18	Clay loam	CL, CL–ML	A–6, A–4	0	70–90	60–80
			18–36	Gravelly sandy loam and sandy loam.	GM, SM, or SC	A–2, A–4	2	55–90	50–80
			36–60	Gravelly loamy sand.	GM, SM	A–1, A–2	5	50–85	30–50
Canadice: Ca	0–½	>6	0–9	Silty clay loam	ML, CL	A–6	0	100	95–100
			9–55	Silty clay	CL	A–7	0	100	95–100
			55–70	Silty clay and silty clay loam.	CL	A–7	0	100	95–100
Caneadea: CcA, CcB	½–1½	>6	0–9	Silt loam	ML, CL	A–6	0	100	95–100
			9–55	Silty clay and silty clay loam.	CL	A–7	0	100	95–100
			55–96	Silt loam	ML, CL	A–4, A–6	0	100	95–100
Canfield: CdA, CdB, CdB2, CdC2, CeC. Urban land part of CeC not rated.	1½–3	>6	0–9	Silt loam	ML	A–4	0	85–95	80–95
			9–22	Silt loam and loam.	CL–ML, CL	A–4, A–6	0	85–95	80–95
			22–50	Loam	ML, CL–ML	A–4	0	80–95	80–95
			50–70	Loam	CL–ML	A–4	5	80–95	70–95
Cardington: CfB, CgB, CgC2, CgE2.	1½–3	>6	0–8	Silt loam	ML, CL–ML	A–4	0	95–100	85–100
			8–32	Silty clay loam	CL	A–6	0	95–100	85–100
			32–75	Silty clay loam	CL, CL–ML	A–6	5	90–95	80–95
Carlisle: Ch	0–½	>6	0–138	Muck	Pt		0		
Chagrin: Cm	[2] >3	>6	0–8	Silt loam	ML	A–4	0	95–100	90–100
			8–38	Silt loam	ML, CL–ML	A–4	0	95–100	90–100
			38–60	Silt loam	ML, SM	A–4	0	85–95	80–95
Chili: CnA, CnB, CnC, CoC2, CoE2, CoF2, CpA, CpB, CpC, CuB. Urban land part of CuB not rated.	>5	>6	0–13	Loam, gravelly loam.	ML, CL–ML	A–4	0	80–90	70–90
			13–21	Gravelly loam	ML, CL–ML	A–4	2	70–90	65–85
			21–53	Gravelly clay loam.	CL	A–6	5	65–80	60–75
			53–60	Loamy sand	SM, SW	A–1, A–2	0	70–95	60–80
Condit: Cy	0–½	>6	0–8	Silt loam	ML, CL–ML	A–4, A–6	0	95–100	85–100
			8–48	Silty clay loam and clay loam.	CL	A–6, A–7	0	95–100	85–100
			48–60	Silty clay loam	CL	A–6	5	90–100	80–95

significant in engineering

The soils in such mapping units may have different properties and limitations, and for this reason it is necessary to follow care- of this table. The symbol < means less than; the symbol > means more than]

Percentage passing sieve—Con.		Permeability	Available water capacity	Reaction	Liquid limit	Plasticity index	Shrink-swell potential	Corrosivity	
No. 40 (0.42 mm)	No. 200 (0.074 mm)							Uncoated steel	Concrete
		In per hr	*In per in of soil*		*Percent*				
80–95	70–90	0.6–2.0	0.17–0.20	5.6–6.5	20–35	4–12	Low	High	Moderate.
80–95	70–90	0.06–0.2	0.12–0.17	4.8–6.5	20–40	11–20	Moderate	High	Moderate.
70–85	60–80	0.06–0.2	0.06–0.10	7.4–7.8	20–40	11–18	Moderate	High	Low.
70–85	60–80	2.0–6.0	0.14–0.18	5.1–5.5	25–35	4–10	Low	Low	Moderate.
25–55	25–55	2.0–6.0	0.08–0.12	4.5–6.0	25–40	2–10	Low	Low	Moderate.
60–75	55–70	0.6–6.0	0.12–0.16	5.6–6.0	20–35	[1] NP–10	Low	Low	Moderate.
55–70	50–65	0.6–6.0	0.08–0.12	4.5–5.5	20–40	8–18	Low	Low	Moderate.
45–70	25–55	2.0–6.0	0.06–0.10	4.5–6.0	15–30	4–10	Low	Low	Moderate.
25–45	20–35	>6.0	0.03–0.07	6.6–7.3	NP	NP	Low	Low	Moderate.
90–98	85–95	0.2–0.6	0.14–0.18	5.6–6.0	20–40	11–20	Moderate	High	Moderate.
90–98	80–95	<0.06	0.10–0.16	5.6–7.3	40–50	17–30	Moderate	High	Moderate.
90–98	80–95	<0.06	0.06–0.10	6.6–7.8	40–50	17–27	Moderate	High	Low.
90–98	80–95	0.6–2.0	0.14–0.20	6.6–7.3	30–40	11–20	Low	High	Low.
90–98	85–95	<0.06	0.10–0.16	6.1–7.8	40–50	17–30	Moderate	High	Low.
90–98	80–95	<0.06	0.08–0.12	7.4–7.8	20–40	8–20	Low	High	Low.
75–90	65–90	0.6–2.0	0.16–0.20	5.1–5.5	20–35	NP–8	Low	Moderate	Moderate.
75–90	65–90	0.6–2.0	0.13–0.17	4.5–5.0	20–40	4–13	Low	Moderate	High.
70–85	60–70	0.06–0.2	0.07–0.10	5.0–6.5	20–40	4–10	Low	Moderate	Moderate.
60–80	50–65	0.06–0.2	0.07–0.10	6.6–7.3	20–40	4–10	Low	Moderate	Low.
80–90	70–95	0.6–2.0	0.16–0.20	5.5–6.5	20–35	4–12	Low	Moderate	Moderate.
80–90	70–85	0.2–0.6	0.12–0.17	4.5–7.8	20–40	11–20	Moderate	High	Moderate.
70–85	60–80	0.06–0.2	0.06–0.10	7.4–7.8	20–40	11–18	Moderate	High	Low.
----------	----------	2.0–6.0	0.20–0.26	5.1–7.8	----------	----------	----------	High	Low.
85–95	70–85	0.6–2.0	0.17–0.21	6.6–7.3	20–40	4–10	Low	Low	Low.
85–95	60–75	0.6–2.0	0.15–0.19	6.1–7.3	20–40	4–10	Low	Low	Low.
70–90	45–70	0.6–6.0	0.13–0.17	6.6–7.3	20–40	4–10	Low	Low	Low.
60–80	55–75	2.0–6.0	0.12–0.18	6.6–7.3	<30	NP–8	Low	Low	Low.
60–80	55–75	2.0–6.0	0.08–0.14	5.1–6.5	20–40	4–10	Low	Low	Moderate.
55–70	50–65	2.0–6.0	0.05–0.12	4.5–6.0	20–40	11–18	Low	Low	High.
50–65	15–30	>6.0	0.02–0.04	6.1–6.5	NP	NP	Low	Low	Low.
80–95	75–95	0.6–2.0	0.18–0.22	5.6–7.3	20–40	6–14	Low	High	Moderate.
80–95	75–90	0.06–0.2	0.14–0.18	5.1–6.5	30–50	12–28	Moderate	High	Moderate.
75–90	70–80	0.06–0.2	0.10–0.14	7.4–7.8	20–40	11–20	Moderate	High	Low.

TABLE 5.—*Estimated soil properties*

Soil series and map symbols	Depth to— Seasonal high water table	Depth to— Bedrock	Depth from surface	USDA texture	Classification: Unified	Classification: AASHTO	Coarse fraction greater than 3 inches	Percentage passing sieve— No. 4 (4.7 mm)	Percentage passing sieve— No. 10 (2.0 mm)
	Ft	*Ft*	*In*				*Pct*		
Ellsworth: ElB, ElB2, ElC, ElC2, ElE2, ElF, EsB, EsC2, EuB.	1½–3	>6	0–8	Silt loam	ML	A–4	0	90–100	90–100
In EsB and EsC2, bedrock is within 5 feet.			8–33	Silty clay loam and silty clay.	CL, CH	A–6, A–7	0	90–100	85–100
Urban land part of EuB not rated.			33–60	Silty clay loam	CL	A–6	2	85–98	80–95
Fitchville: FcA, FcB, FlA	½–1½	>6	0–15	Silt loam	ML, CL–ML	A–4, A–6	0	100	95–100
FlA is subject to occasional flooding.			15–30	Silty clay, clay	CL	A–6	0	100	95–100
			30–50	Loam	ML, CL–ML	A–4, A–6	0	100	95–100
			50–70	Sandy loam	SM	A–2, A–4	0	95–100	80–95
Geeburg: GbC	1½–3	>6	0–8	Silt loam	ML, CL–ML	A–6, A–4	0	95–100	95–100
			8–28	Silty clay and silty clay loam.	CH, CL	A–7, A–6	0	95–100	95–100
			28–60	Silty clay	CH, CL	A–7, A–6	0	100	100
Glenford: GfA, GfB, GfC2	1½–3	>6	0–9	Silt loam	ML	A–4	0	100	95–100
			9–46	Silt loam and silty clay loam.	CL, CL–ML	A–6, A–4	0	100	95–100
			46–60	Sandy loam	SM	A–2, A–4	0	95–100	80–95
Haskins: HsA, HsB	½–1½	>6	0–9	Loam	ML	A–4	0	95–100	90–100
			9–29	Clay loam and sandy clay loam.	CL, SC	A–6	0	85–95	80–95
			29–34	Silty clay loam	CL	A–6	0	90–100	85–95
			34–60	Silty clay	CH, CL	A–7	0	90–100	85–100
Holly: Hy	[2] 0–½	>6	0–9	Silt loam	ML	A–4	0	95–100	90–100
			9–28	Silt loam and loam.	ML, CL–ML	A–4	0	95–100	90–100
			28–60	Sandy loam	SM	A–2, A–4	0	90–100	85–95
Jimtown: JtA, JtB, Ju	½–1½	>6	0–9	Loam	ML	A–4	0	85–95	70–95
Urban land part of Ju not rated.			9–29	Sandy loam and sandy clay loam.	SM, SC	A–2, A–4	0	80–95	50–70
			29–60	Gravelly sandy clay loam.	SC, SM	A–4, A–2	5	60–80	45–60
Linwood: Ld	0–½	>6	0–24	Muck	Pt		0		
			24–60	Silt loam	ML	A–4	0	95–100	90–100
Lobdell: Le	[2] 1½–3	>6	0–32	Silt loam and loam.	ML	A–4	0	95–100	80–100
			32–60	Silt loam	ML	A–4	0	80–100	70–95
Lorain: Ln	0–½	>6	0–6	Silty clay loam	CL	A–6	0	100	95–100
			6–39	Silty clay	CH	A–7	0	100	95–100
			39–56	Silty clay loam	CH, CL	A–7, A–6	0	100	95–100
			56–60	Silt loam	ML	A–4	0	100	95–100
Loudonville: LoB, LoC, LoC2, LoE2.	>3	2–3½	0–8	Silt loam	ML	A–4	2–5	80–95	80–90
			8–28	Silt loam	ML, CL	A–4, A–6	2–10	70–90	65–90
			28	Sandstone bedrock.					
Luray: Ly	0–½	>6	0–10	Silt loam	ML	A–4	0	100	95–100
			10–38	Silt loam and silty clay loam.	ML, CL	A–4, A–6	0	100	95–100
			38–63	Silt loam	ML	A–4	0	100	95–100

significant in engineering—Continued

Percentage passing sieve—Con.		Permeability	Available water capacity	Reaction	Liquid limit	Plasticity index	Shrink-swell potential	Corrosivity	
No. 40 (0.42 mm)	No. 200 (0.074 mm)							Uncoated steel	Concrete
		In per hr	*In per in of soil*		*Percent*				
80–95	80–95	0.6–2.0	0.16–0.20	6.1–6.5	25–40	4–10	Low	Moderate	Low.
80–95	80–90	0.06–0.2	0.14–0.17	4.5–6.5	30–55	14–28	Moderate	High	Moderate to high.
75–90	70–85	>0.06	0.06–0.10	7.4–7.8	20–40	12–22	Moderate	High	Low.
90–100	85–100	0.6–2.0	0.18–0.20	5.6–7.3	20–40	4–12	Low	High	Moderate.
90–100	85–100	0.2–0.6	0.15–0.18	4.5–5.5	20–40	11–20	Moderate	High	Moderate.
80–95	60–75	0.2–0.6	0.12–0.16	6.1–6.5	20–40	6–16	Low	High	Low.
65–80	20–40	2.0–6.0	0.12–0.15	6.6–7.3	<35	NP–11	Low	High	Low.
90–100	85–100	0.6–2.0	0.16–0.18	5.6–6.0	20–40	6–12	Moderate	Moderate	Moderate.
90–100	90–100	0.06–0.2	0.10–0.15	5.1–7.3	30–55	15–30	High	High	Moderate.
90–100	90–100	>0.06	0.06–0.10	7.4–7.8	30–55	15–30	High	High	Low.
85–95	80–95	0.6–2.0	0.18–0.20	5.1–6.5	20–40	4–10	Low	Moderate	Moderate.
85–95	80–95	0.2–0.6	0.15–0.18	4.5–6.5	20–40	8–18	Moderate	Moderate	Moderate to high.
65–80	30–40	2.0–6.0	0.12–0.15	5.6–6.0	<35	NP–8	Low	Moderate	Moderate.
80–95	60–70	0.6–2.0	0.14–0.18	6.1–6.5	<35	NP–8	Low	High	Low.
65–85	40–70	0.6–2.0	0.12–0.16	5.1–6.0	20–40	11–18	Moderate	High	Moderate.
80–95	80–95	0.06–0.2	0.10–0.14	5.6–6.0	20–40	11–20	Moderate	High	Moderate.
85–98	80–95	>0.06	0.08–0.12	7.4–7.8	40–60	18–35	High	High	Low.
80–95	70–90	0.6–2.0	0.18–0.22	6.1–6.5	20–40	4–10	Low	High	Low.
80–95	60–90	0.2–2.0	0.16–0.20	5.6–7.3	20–40	4–10	Low	High	Low.
65–80	30–40	0.6–2.0	0.12–0.15	6.6–7.8	<35	NP–8	Low	High	Low.
65–80	50–75	0.6–2.0	0.13–0.17	6.1–6.5	20–40	4–8	Low	High	Low.
35–60	25–50	0.6–2.0	0.12–0.16	4.5–6.0	20–40	4–12	Low	High	Moderate.
30–50	20–40	0.6–6.0	0.10–0.14	5.1–6.0	20–40	NP–8	Low	High	Moderate.
---	---	0.6–6.0	0.20–0.26	4.5–6.5	---	---	---	High	Moderate to high.
80–95	60–85	0.2–0.6	0.14–0.18	7.4–7.8	20–40	4–10	Low	High	Low.
75–90	60–85	0.6–2.0	0.18–0.23	5.6–7.3	20–40	4–10	Low	Moderate	Moderate.
65–85	60–80	0.6–2.0	0.16–0.20	6.1–6.5	20–40	4–10	Low	Moderate	Low.
90–100	80–100	0.2–0.6	0.16–0.19	5.5–6.0	20–40	11–20	Moderate	High	Moderate.
90–100	80–100	0.06–0.2	0.13–0.16	5.1–6.0	50–60	25–35	High	High	Moderate.
90–100	80–100	0.06–0.2	0.12–0.15	5.6–7.3	30–55	15–30	Moderate	High	Moderate.
90–100	70–90	0.06–0.2	0.12–0.15	6.6–7.3	20–40	6–10	Low	Moderate	Low.
70–85	65–85	0.6–2.0	0.16–0.20	5.6–6.0	20–40	4–10	Low	Low	Moderate.
60–80	55–75	0.6–2.0	0.10–0.16	4.5–6.0	20–40	8–18	Low	Low	Moderate to high.
85–100	70–90	0.6–2.0	0.20–0.23	5.6–6.5	20–40	4–10	Low	High	Moderate.
85–100	70–95	0.2–0.6	0.14–0.18	4.5–6.5	20–40	8–18	Moderate	High	Moderate.
85–100	70–90	0.2–0.6	0.14–0.18	5.1–6.5	20–40	4–10	Low	High	Moderate.

TABLE 5.—*Estimated soil properties*

Soil series and map symbols	Depth to— Seasonal high water table	Depth to— Bedrock	Depth from surface	USDA texture	Classification: Unified	Classification: AASHTO	Coarse fraction greater than 3 inches	Percentage passing sieve— No. 4 (4.7 mm)	Percentage passing sieve— No. 10 (2.0 mm)
	Ft	*Ft*	*In*				*Pct*		
Mahoning: MgA, MgB, MlA, MlB, MnA. In MlA and MlB, bedrock is within 5 feet. Urban land part of MnA not rated.	½–1½	>6	0–9	Silt loam	ML	A–4	0	95–100	90–100
			9–34	Silty clay loam and silty clay.	CL, CL–ML	A–6, A–7	0	95–100	90–100
			34–67	Silty clay loam	CL	A–6	0	90–100	80–95
Miner: Mr	0–½	>6	0–13	Silty clay loam	CL	A–6	0	95–100	90–100
			13–50	Silty clay and silty clay loam.	CH, CL	A–7	0	95–100	90–100
			50–70	Silty clay loam	CL	A–6, A–7	0	95–100	90–100
Olmsted: Od	0–½	>6	0–9	Loam	ML	A–4	0	85–95	80–95
			9–46	Sandy clay loam, gravelly sandy clay loam, and gravelly clay loam.	CL, SC	A–6, A–4	3	80–95	75–90
			46–78	Gravelly loam, silt loam, and gravelly sandy clay loam.	ML, CL, SC	A–4, A–6, A–2	5	75–90	70–90
Orrville: Or, Os. In Os, bedrock is within a depth of 5 feet.	[2] ½–1½	>6	0–28	Silt loam	ML	A–4	0	95–100	90–100
			28–36	Sandy loam	SM, SC	A–2, A–4	0	95–100	90–100
			36–60	Clay loam and silty clay loam.	CL, CL–ML	A–6	0	95–100	90–100
Oshtemo: OtB	>5	>6	0–33	Sandy loam	SM	A–2, A–4	0	95–100	90–100
			33–65	Gravelly sandy clay loam and gravelly sandy loam.	SC, CL	A–6, A–4	3	70–95	65–90
			65–79	Gravelly loamy sand.	SM	A–2	5	70–90	60–80
Ravenna: ReA, ReB, RnA. Urban land part of RnA not rated.	½–1½	>6	0–12	Silt loam	ML, CL–ML	A–4	0	95–100	90–100
			12–30	Silt loam and loam.	ML, CL	A–4, A–6	0	90–100	85–100
			30–57	Loam	ML, CL	A–4, A–6	0	85–95	80–95
			57–68	Loam	ML, SM	A–4	1–5	80–95	75–95
Rawson: RoB	1½–3	>6	0–8	Loam	ML	A–4	0	90–100	85–100
			8–30	Loam and sandy clay loam.	ML, SC, CL	A–4, A–6	0	85–100	80–100
			30–60	Sitly clay	CH, CL	A–7	0	95–100	90–100
Rittman: RsB, RsB2, RsC, RsC2, RsE2, RsF.	1½–3	>6	0–10	Silt loam	ML	A–4	0	95–100	90–100
			10–26	Silty clay loam and clay loam.	CL, ML	A–6, A–7	0	90–100	85–100
			26–40	Clay loam	CL, CL–ML	A–6, A–4	0	85–100	80–95
			40–60	Clay loam	CL, CL–ML	A–6, A–4	1–3	85–95	80–95
Schaffenaker: ScF	>3	2–3½	0–10	Loamy sand	SM	A–2	1–3	85–95	80–90
			10–38	Flaggy loamy sand.	SM	A–2	10–20	55–75	50–65
			38	Sandstone bedrock.					

significant in engineering—Continued

Percentage passing sieve—Con.		Permeability	Available water capacity	Reaction	Liquid limit	Plasticity index	Shrink-swell potential	Corrosivity	
No. 40 (0.42 mm)	No. 200 (0.074 mm)							Uncoated steel	Concrete
		In per hr	*In per in of soil*		*Percent*				
85–98	70–90	0.6–2.0	0.16–0.20	5.6–6.0	25–40	4–10	Low	High	Moderate.
85–98	80–90	0.06–0.2	0.12–0.16	4.5–7.8	30–50	12–28	Moderate	High	Moderate to high.
75–90	70–90	<0.06	0.08–0.12	7.4–7.8	20–40	11–20	Moderate	High	Low.
90–100	85–95	0.6–2.0	0.19–0.23	6.1–7.3	20–40	11–20	Moderate	High	Low.
90–100	85–95	0.06–0.2	0.13–0.16	5.5–7.3	40–55	20–32	High	High	Moderate.
80–95	70–90	<0.06	0.08–0.12	7.4–7.8	25–45	14–24	Moderate	High	Low.
70–85	60–75	0.6–2.0	0.16–0.20	6.6–7.3	20–40	NP–10	Low	High	Low.
60–80	35–55	0.6–2.0	0.14–0.18	5.1–7.3	20–40	8–18	Low	High	Low to moderate.
60–80	25–75	0.6–6.0	0.10–0.15	5.6–7.8	20–40	6–15	Low	High	Low to moderate.
80–95	70–90	0.6–2.0	0.18–0.22	5.6–7.3	20–40	4–10	Low	High	Moderate.
60–75	30–40	2.0–6.0	0.12–0.15	5.1–6.5	NP–30	NP–8	Low	High	Moderate.
80–95	70–90	0.6–2.0	0.14–0.16	6.1–6.5	20–40	11–18	Low	High	Low.
60–70	25–40	2.0–6.0	0.08–0.12	5.1–6.5	NP	NP	Low	Low	Moderate.
55–70	30–55	2.0–6.0	0.06–0.12	4.5–6.0	20–40	6–18	Low	Low	Moderate to high.
45–65	10–25	>6.0	0.04–0.06	6.6–7.3	NP	NP	Low	Low	Low.
80–95	70–90	0.6–2.0	0.16–0.20	5.6–6.0	20–35	4–10	Low	High	Moderate.
75–90	65–85	0.6–2.0	0.12–0.16	4.5–5.5	20–40	8–18	Low	High	Moderate to high.
75–90	55–75	0.06–0.2	0.07–0.11	5.6–6.0	20–40	8–18	Low	High	Moderate.
60–80	45–60	0.06–0.2	0.04–0.08	6.1–6.5	20–40	4–8	Low	High	Low.
75–90	60–75	0.6–2.0	0.14–0.18	6.1–6.5	<36	NP–8	Low	Moderate	Low.
70–85	40–65	0.6–2.0	0.12–0.16	5.1–7.3	20–40	8–18	Low	High	Moderate.
85–100	80–95	<0.06	0.08–0.14	6.1–7.8	40–58	18–32	High	High	Low.
80–95	70–90	0.6–2.0	0.16–0.20	5.1–6.0	20–40	4–10	Low	Moderate	Moderate.
75–95	70–95	0.6–2.0	0.12–0.16	4.5–5.5	20–45	11–20	Moderate	High	High.
75–90	70–80	0.06–0.2	0.06–0.10	5.1–7.3	20–40	8–18	Low	High	Low to moderate.
75–90	65–80	0.06–0.2	0.06–0.10	7.4–7.8	20–40	8–18	Low	High	Low.
60–75	15–30	>6.0	0.04–0.06	4.5–5.5	NP	NP	Low	Low	High.
30–50	10–30	>6.0	0.04–0.06	4.5–5.5	NP	NP	Low	Low	High.

TABLE 5.—*Estimated soil properties*

Soil series and map symbols	Depth to— Seasonal high water table	Depth to— Bedrock	Depth from surface	USDA texture	Classification: Unified	Classification: AASHTO	Coarse fraction greater than 3 inches	Percentage passing sieve— No. 4 (4.7 mm)	Percentage passing sieve— No. 10 (2.0 mm)
	Ft	*Ft*	*In*				*Pct*		
Sebring:									
Sg	0–½	>6	0–9	Silt loam	ML	A–4	0	100	95–100
			9–45	Silt loam	ML, CL	A–4, A–6	0	100	95–100
			45–75	Silt loam	ML, CL–ML	A–4	0	95–100	95–100
St. Properties to a depth of 45 inches are the same as those for Sg.	0–½	>6	45–60	Silty clay loam	CL	A–6	0	85–100	85–100
Tiro. Mapped only in complex with Bennington soils.	½–1½	>6	0–10	Silt loam	ML, CL–ML	A–4	0	95–100	90–100
			10–29	Silty clay loam	CL, CL–ML	A–6	0	95–100	90–100
			29–45	Clay loam and silty clay loam.	CL, CL–ML	A–6	0	90–100	85–95
			45–96	Silty clay loam	CL	A–6	1–3	85–95	80–95
Wadsworth: WaA, WaB, WbB. Urban land part of WbB not rated.	½–1½	>6	0–9	Silt loam	ML, CL–ML	A–4	0	95–100	90–100
			9–21	Silty clay loam	CL, CL–ML	A–6	0	95–100	90–100
			21–52	Clay loam and silt loam.	CL, ML	A–6, A–4	0	90–100	80–100
			52–80	Silt loam	CL, ML	A–6, A–4	1–3	85–100	80–100
Wallkill: Wc	[2] 0–½	>6	0–9	Silt loam	ML, CL–ML	A–4	0	95–100	95–100
			9–21	Silty clay loam	CL	A–7, A–6	0	95–100	95–100
			21–56	Muck	Pt		0		
			56–72	Coprogenous earth.			0		
Willette: Wt	0–½	>6	0–30	Muck	Pt		0		
			30–60	Silty clay loam	CL	A–7	0	95–100	90–100
Wooster: WuB, WuB2, WuC2, WuE2, WuF.	>3	>6	0–13	Silt loam	ML	A–4	0	90–100	85–100
			13–31	Loam	ML, CL	A–4, A–6	0	90–100	80–100
			31–42	Loam	ML, CL	A–4, A–6	1–5	85–95	80–95
			42–75	Loam	ML, SM	A–4	1–5	75–95	70–95

[1] NP = Nonplastic.

filtered can contaminate ground water or nearby springs, lakes, or streams. Even though the soils dispose of the effluent quickly, there is a distinct hazard of polluting underground water supplies.

Sewage lagoons.—Sewage lagoons are shallow ponds built to dispose of sewage through oxidation. They may be needed where septic tanks or a central sewage system is not feasible or practical. It is assumed that the natural soil will be used for both the reservoir site and as a source of embankment material. Among the features that control the degree of limitations are the hazard of flooding, degree of slope, depth to bedrock, permeability, coarse fragments, and organic-matter content.

Dwellings.—Major soil features that limit use of soils as homesites are limited depth to bedrock, flooding, poor natural drainage, and excessive slope. Not considered is a method for disposing of sewage, because this is rated separately in this table. The ratings in table 7 are for houses of three stories or less, with or without a basement, but the ratings also apply to sites for small industrial, commercial, and institutional buildings.

Soils susceptible to flooding have severe limitations for permanently used structures. While flooding may be infrequent, it is costly and damaging when it does occur. Homes on naturally wet soils may have wet basements if adequate drainage is not provided. Such

significant in engineering—Continued

Percentage passing sieve—Con.		Permeability	Available water capacity	Reaction	Liquid limit	Plasticity index	Shrink-swell potential	Corrosivity	
No. 40 (0.42 mm)	No. 200 (0.074 mm)							Uncoated steel	Concrete
		In per hr	*In per in of soil*		*Percent*				
90–100	80–95	0.6–2.0	0.18–0.22	5.1–5.5	20–40	4–10	Low	High	Moderate.
90–100	80–95	0.2–0.6	0.16–0.20	4.5–6.0	20–40	8–18	Low	High	Moderate to high.
90–100	80–95	0.2–0.6	0.14–0.18	6.6–7.3	20–40	4–10	Low	High	Low.
80–95	75–95	0.06–0.2	0.06–0.10	6.6–7.8	20–40	11–20	Low	High	Low.
85–95	75–90	0.6–2.0	0.18–0.22	5.1–6.5	20–40	4–10	Low	High	Moderate.
85–95	80–90	0.2–0.6	0.16–0.20	4.5–6.0	20–40	11–20	Moderate	High	Moderate to high.
75–90	65–85	0.06–0.2	0.14–0.18	6.1–7.3	20–40	11–20	Moderate	High	Low.
70–90	60–80	0.06–0.2	0.06–0.10	7.4–7.8	20–40	11–20	Low	High	Low.
85–95	70–90	0.6–2.0	0.18–0.10	4.5–5.5	20–40	4–10	Moderate	High	High.
80–95	70–95	0.2–0.6	0.15–0.18	4.5–5.5	20–40	11–20		High	High.
75–95	70–80	0.06–0.2	0.06–0.10	4.5–7.3	20–40	8–16	Low	High	Moderate.
75–95	70–85	0.06–0.2	0.06–0.10	7.4–7.8	20–40	8–16	Low	High	Low.
85–95	75–90	0.6–2.0	0.18–0.22	5.6–6.5	20–40	6–10	Low	High	Moderate.
90–98	85–95	0.2–0.6	0.15–0.19	5.1–7.3	35–50	15–30	Moderate	High	Moderate.
---	---	---	0.20–0.26	6.6–7.3	---	---	---	High	Low.
---	---	---	---	7.4–7.8	---	---	---	High	Low.
---	---	2.0–6.0	0.20–0.26	4.5–6.0	---	---	---	High	Moderate to high.
85–95	80–95	0.06–0.2	0.10–0.15	4.5–7.3	40–50	18–30	Low to moderate.	High	Moderate to high.
75–90	60–85	0.6–2.0	0.16–0.20	6.1–7.3	20–40	4–10	Low	Low	Low.
75–90	60–85	0.6–2.0	0.12–0.15	4.5–6.0	20–40	6–14	Low	Low	Moderate to high.
65–80	50–90	0.2–0.6	0.07–0.12	4.5–5.0	20–40	6–12	Low	Low	Moderate to high.
60–80	45–70	0.2–0.6	0.07–0.12	5.0–7.3	20–40	4–10	Low	Low	Low to moderate.

[2] Subject to flooding.

soils as Mahoning, Fitchville, and Wadsworth are among the soils in this county where wetness is a concern. In many areas tile drains and open ditches have been installed for farming uses. Excavations in these areas for structures such as homes can disrupt the established drainage system and change the soil back to its natural condition of wetness.

Glenford soils and others that have a high silt content are not so suitable for supporting house foundations as Chili soils and other coarser textured soils. Soils that have high shrink-swell properties are likely to heave and crack foundations unless precautions are observed. Also, high shrink-swell properties affect the alinement of sidewalks, patios, floors, and rock walls. To minimize this effect, a subgrade or layers of sandy or gravelly material directly below the structure are desirable.

Excavating basements and installing underground utility lines are difficult and expensive in soils that have a limited depth to bedrock. Soils that have slopes of more than 12 percent have an erosion hazard and need more excavation and leveling than soils that are less sloping.

Local roads and streets.—The ratings in table 7 are for soils used for roads and streets in residential areas where traffic is not heavy. Considered in estimating the ratings were the hazard of flooding, slope, depth to and kind of bedrock, depth to the water table, and

TABLE 6.—*Engineering*

[An asterisk in the first column indicates that at least one mapping unit in this series is made up of two or more kinds of soil. The the instructions for referring to other series

Soil series and map symbols	Suitability for winter grading	Susceptibility to frost action	Suitability as a source of— Topsoil	Sand and gravel	Road fill
*Bennington: BnA, BnB, BoA. For Tiro part of BoA, see Tiro series.	Poor: seasonal high water table; soft and plastic where wet.	High	Fair: thin layer.	Unsuited	Fair: somewhat poorly drained; high susceptibility to frost action; moderate shrink-swell potential.
Berks: BrF	Poor: very steep	Low	Poor: thin layer; very steep.	Unsuited	Poor: very steep; bedrock at a depth of 20 to 40 inches.
Bogart: BtA, BtB	Fair to good	Moderate	Fair: thin layer; gravelly in places.	Fair below a depth of 2 to 3 feet.	Good
Canadice: Ca	Poor: seasonal high water table; clayey, plastic material.	Moderate	Poor: small amount of suitable material; poorly drained.	Unsuited	Poor: clayey material; moderate shrink-swell potential; poor workability.
Caneadea: CcA, CcB	Poor: seasonal high water table; clayey, plastic material.	Moderate	Fair: small amount of suitable material; seasonal high water table.	Unsuited	Poor: clayey material; moderate shrink-swell potential; poor workability.
Canfield: CdA, CdB, CdB2, CdC2, CeC. Urban land part of CeC not rated.	Fair: seasonal high water table of short duration; loamy material.	Moderate	Good	Unsuited	Fair: moderate stability; low shrink-swell potential; easy to compact; slopes erodible.
Cardington: CfB, CgB, CgC2, CgE2.	Poor: seasonal high water table of short duration; soft and plastic where wet.	High	Fair for CfB, CgB, and CgC2: suitable material limited. Poor for CgE2: slope.	Generally not suitable; sand and gravel at a depth of 5 to 10 feet in some places near Lodi.	Fair: moderate stability and shrink-swell potential; fair workability; slopes erodible.

interpretations

soils in such mapping units have different properties and limitations, and for this reason it is necessary to follow carefully that appear in the first column of this table]

Soil features affecting—						
Highway location	Ponds		Drainage of crops and pasture	Sprinkler irrigation	Terraces or diversions	Grassed waterways
	Reservoir area	Embankment				
Seasonal high water table; soft and plastic where wet; slow permeability.	Seasonal high water table; slow seepage.	Fair to good stability and compaction; slow permeability where compacted; good resistance to piping; slow seepage.	Slow permeability; seasonal high water table.	Moderately slow infiltration; slow permeability; seasonal high water table.	Nearly level to gently sloping; moderate erodibility.	Nearly level to gently sloping; moderate runoff; somewhat poorly drained.
Very steep; siltstone bedrock at a depth of 20 to 40 inches.	Siltstone bedrock at a depth of 20 to 40 inches; very steep.	Fair stability; limited amount of channery material; permeable.	Good natural drainage.	Low available water capacity; very steep.	Very steep; bedrock at a depth of 20 to 40 inches.	Bedrock at a depth of 20 to 40 inches; very steep.
Seasonal high water table of short duration; easy to work.	Sandy and gravelly soil material; rapid seepage.	Fair stability; fair to good compaction; moderate to rapid permeability where compacted.	Seasonal high water table of short duration; rapid permeability; ditchbanks unstable.	Moderate to low available water capacity; rapid water intake.	Generally not needed; slow to moderate runoff; short slopes.	Mostly gentle slopes; small amount of runoff; droughty during extended dry periods.
Seasonal high water table; clayey, plastic material; poor workability.	Seasonal high water table; very slow seepage.	Clayey material; poor compaction; very slow permeability.	Very slow permeability; seasonal high water table.	Seasonal high water table; slow infiltration; poor drainage.	Not needed; nearly level.	Clayey below surface layer; difficult to work; poor drainage.
Seasonal high water table; clayey, plastic material; poor workability.	Seasonal high water table; very slow seepage.	Clayey material; poor compaction; medium to high compressibility.	Very slow permeability; seasonal high water table.	Seasonal high water table; slow infiltration; slow permeability; somewhat poor drainage.	Generally not needed; somewhat poor drainage.	Clayey below surface layer; difficult to work; somewhat poor drainage.
Fair stability; moderate susceptibility to frost action.	Sloping in places.	Fair to good stability and compaction; moderate seepage; slight piping hazard; medium to low shear strength.	Moderately good natural drainage; slow permeability in fragipan; moderate to rapid surface runoff in sloping areas.	Moderate available water capacity; medium water intake rate.	Slight wetness and seepage; sloping in places.	Erodible; difficult to vegetate eroded areas; fairly easy to work.
Seasonal high water table of short duration; soft and plastic where wet; slow permeability; moderately steep to steep in places.	Slow to moderate seepage; moderately steep to steep in places.	Fair to good stability and resistance to piping; slow permeability where compacted; medium to low shear strength.	Moderately good natural drainage; slow permeability; moderate to rapid surface runoff.	Moderate available water capacity; medium water intake rate; slow permeability.	Erodible; short and irregular slopes in places; slight wetness and seepage.	Gently sloping to steep; erodible; moderate to rapid runoff; seepage in places.

TABLE 6.—*Engineering*

Soil series and map symbols	Suitability for winter grading	Susceptibility to frost action	Suitability as a source of—		
			Topsoil	Sand and gravel	Road fill
Carlisle: Ch	Poor: soft, organic soil.	High	Fair to good if mixed with mineral soil material; poor if used alone.	Unsuited	Poor: organic material.
Chagrin: Cm	Fair: susceptible to flooding.	Moderate	Good	Generally not suitable; deposits in pockets below a depth of 3 to 5 feet.	Fair: low strength.
Chili: CnA, CnB, CnC, CoC2, CoE2, CoF2, CpA, CpB, CpC, CuB. Urban land part of CuB not rated.	Good	Low	Fair if not gravelly; poor if gravelly; steep and very steep in places.	Fair to a depth of 4 to 5 feet. Good below a depth of 4 to 5 feet.	Good where slopes are less than 12 percent. Fair where slopes are 12 to 25 percent. Poor where slopes are 25 to 70 percent.
Condit: Cy	Poor: seasonal high water table; soft and plastic where wet.	High	Poor: poorly drained; suitable material limited.	Unsuited	Poor: poorly drained; high susceptibility to frost action; moderate shrink-swell potential.
Ellsworth: ElB, ElB2, ElC, ElC2, ElE2, ElF, EsB, EsC2, EuB. Urban land part of EuB not rated.	Poor: soft, clayey, plastic material.	Moderate	Fair: suitable material limited; sloping to very steep in places.	Unsuited	Fair: clayey material; moderate susceptibility to frost action; moderate shrink-swell potential.
Fitchville: FcA, FcB, FlA	Poor: soft, easily compressible material; seasonal high water table.	High	Fair: suitable material limited.	Unsuited	Poor: high in silt.

interpretations—Continued

Soil features affecting—						
Highway location	Ponds: Reservoir area	Ponds: Embankment	Drainage of crops and pasture	Sprinkler irrigation	Terraces or diversions	Grassed waterways
Deep organic soil; high water table; soft and unstable.	High water table; organic material.	Unstable organic material; rapid seepage.	High water table; very unstable; susceptible to subsidence.	Very high available water capacity and water intake rate; very poor drainage; susceptible to blowing if drained.	Not needed ----	High water table; unstable material.
Susceptible to flooding; low stability; moderate susceptibility to frost action.	Susceptible to overflow; moderate to rapid seepage; sandy seams.	Fair to poor stability and fair compaction; moderate permeabilty where compacted; low resistance to piping; sandy seams.	Good natural drainage.	High available water capacity; medium water intake rate; susceptible to flooding.	Generally not needed; nearly level; susceptible to flooding and siltation.	Generally not needed; susceptible to flooding and siltation.
Erodible on exposed embankments; droughty in cuts; steep and very steep in places; well drained; good stability.	Rapid seepage --	Good stability and compaction; rapid permeability; susceptible to piping; sandy and gravelly.	Good natural drainage.	Moderate to low available water capacity; rapid water intake.	Generally not needed; droughty; sandy and gravelly; slow to moderate runoff; short slopes; slopes of more than 12 percent in places.	Moderately erodible; droughty; slopes of more than 12 percent in places.
High water table most of year; plastic subsoil; slow permeability; high susceptibility to frost action.	High water table most of year; slow seepage.	Fair to good stability and compaction; medium to low shear strength; slow permeability of compacted soil.	Poor drainage; outlets difficult to obtain in places; slow permeability.	Poor drainage; slow water intake.	Generally not needed; nearly level.	Poor drainage.
Seasonal high water table of short duration; susceptible to seepage; steep to very steep in places; moderate susceptibility to frost action; bedrock at a depth of 40 to 60 inches in places.	Slow seepage; seasonal high water table of short duration.	Fair to good stability and compaction; slow permeability; medium to low shear strength.	Moderately good natural drainage; slow permeability; moderate to rapid runoff.	Moderate water intake rate; low to moderate available water capacity; slow permeability.	Erodible; clayey subsoil; slopes of more than 12 percent in places; slow permeability.	Moderate to rapid runoff; erodible; clayey subsoil; difficult to work where wet; slopes of more than 12 percent in places.
High water table in winter and spring; high susceptibility to frost action; erodible; unstable; flows if wet.	Seasonal high water table; moderate seepage.	Fair to poor stability; slopes readily erodible; fair resistance to piping; medium to low shear strength.	Seasonal high water table; moderately slow permeability; ditchbanks unstable.	High available water capacity; medium water intake rate; somewhat poor drainage.	Generally not needed; somewhat poor drainage; erodible; unstable.	Somewhat poor drainage; short gentle slopes; erodible; fairly easy to work.

TABLE 6.—*Engineering*

Soil series and map symbols	Suitability for winter grading	Susceptibility to frost action	Suitability as a source of— Topsoil	Sand and gravel	Road fill
Geeburg: GbC	Poor: soft, clayey, plastic material.	Moderate	Fair: thin layer.	Unsuited	Poor: clayey material; high shrink-swell potential.
Glenford: GfA, GfB, GfC2	Poor: soft where wet; high susceptibility to frost action.	High	Fair: suitable material limited.	Unsuited	Poor: high susceptibility to frost action.
Haskins: HsA, HsB	Poor: somewhat poorly drained.	Moderate	Fair: small amount of suitable material.	Unsuited	Fair in most of subsoil; poor in the underlying clayey material.
Holly: Hy	Poor: susceptible to flooding; seasonal high water table.	High	Poor: seasonal high water table; good where drained.	Unsuited	Poor: poorly drained.
Jimtown: JtA, JtB, Ju Urban land part of Ju not rated.	Poor: somewhat poorly drained; gravelly and sandy soils.	Moderate	Fair: suitable material limited.	Fair: below a depth of 2 to 4 feet.	Fair: somewhat poorly drained.
Linwood: Ld	Poor: organic material; commonly saturated.	High	Fair to good if mixed with mineral material; poor if used alone.	Unsuited	Poor: organic material.

interpretations—Continued

Soil features affecting—						
Highway location	Ponds: Reservoir area	Ponds: Embankment	Drainage of crops and pasture	Sprinkler irrigation	Terraces or diversions	Grassed waterways
Seasonal high water table during wet periods; highly plastic clay; difficult to work.	Very slow seepage.	Fair stability; fair to poor compaction; very slow permeability where compacted; high shrink-swell potential.	Moderately well drained; very slow permeability.	Slow infiltration; low available water capacity; susceptible to drought in late summer.	Clayey; difficult to work; very slow permeability; slopes of more than 12 percent in places.	Clayey; difficult to work; rapid runoff; erodible.
Seasonal high water table during wet periods; unstable; flows if wet; high susceptibility to frost action.	Moderate seepage.	Poor stability; fair to good compaction; slow permeability where compacted; poor resistance to piping; erodible.	Moderately well drained; moderately slow permeability.	High available water capacity; medium water intake rate.	Somewhat unstable; erodible; slopes of more than 12 percent in places.	Highly erodible; easy to work; most slopes short.
Somewhat poor natural drainage; clayey, plastic material in lower part of subsoil and substratum.	Seasonal high water table; underlying clayey material has low seepage; upper part of soil must be sealed off at embankment.	Substratum has fair stability and slow permeability; fair compaction; good resistance to piping.	Somewhat poor natural drainage; moderate permeability in upper subsoil; slow permeability in lower part of subsoil and substratum.	Moderate infiltration; somewhat poor natural drainage; moderate available water capacity; moderate permeability in upper layers of soil.	Nearly level to gently sloping.	Slightly erodible; nearly level to gently sloping; seasonally wet.
Susceptible to flooding; high water table most of year; high susceptibility to frost action.	Susceptible to stream overflow; seasonal high water table; moderate seepage; contains layers of sandy material.	Fair stability and compaction; slow permeability where compacted; fair resistance to piping; contains layers of sandy material.	Seasonal high water table; susceptible to flooding; outlets difficult to obtain.	High available water capacity; medium water intake rate; poor drainage; susceptible to flooding.	Medium water intake rate; poor natural drainage.	Poorly drained; susceptible to flooding and siltation.
Seasonal high water table; easy to work; moderate frost action.	Sandy and gravelly; rapid seepage.	Fair stability and compaction; rapid seepage.	Somewhat poor natural drainage; moderately rapid permeability; ditchbanks unstable.	Moderate available water capacity; medium to rapid water intake; somewhat poor drainage.	Somewhat poor drainage; slow runoff; susceptible to seepage.	Seasonally wet; easy to work; erodible.
Organic layers have very low stability; high water table.	High water table; high seepage in organic material; slow seepage in mineral material.	Organic material unstable.	High water table; unstable organic material; susceptible to subsidence if drained.	High available water capacity and water intake rate; poor drainage; susceptible to blowing if drained.	Not needed ----	High water table.

TABLE 6.—*Engineering*

Soil series and map symbols	Suitability for winter grading	Susceptibility to frost action	Suitability as a source of— Topsoil	Sand and gravel	Road fill
Lobdell: Le	Poor: seasonal wetness; susceptible to flooding.	Moderate	Good	Generally not suitable; local deposits below a depth of 3 to 5 feet.	Fair: loamy material; low strength.
Lorain: Ln	Poor: wet, clayey	Moderate	Poor: seasonal high water table; fair where drained.	Unsuited	Poor: clayey, plastic material; high shrink-swell potential.
Loudonville: LoB, LoC, LoC2, LoE2.	Fair: well drained; bedrock at a depth of 20 to 40 inches.	Moderate	Fair: suitable material limited; some coarse fragments; slopes of more than 12 percent in places.	Unsuited	Fair: silty and loamy material; bedrock at a depth of 20 to 40 inches.
Luray: Ly	Poor: soft, wet material; high susceptibility to frost action.	High	Poor: seasonal high water table; good to fair where drained.	Generally not suitable; local deposits below a depth of 4 to 5 feet.	Poor: silty material; low strength.
Mahoning: MgA, MgB, MlA, MlB, MnA. Urban land part of MnA not rated.	Poor: wet, clayey material.	Moderate	Fair: thin layer.	Unsuited	Poor: clayey, plastic material; low strength.
Miner: Mr	Poor: wet, clayey material.	Moderate	Fair: thin layer; clayey.	Unsuited	Poor: wet, clayey, plastic material; low strength.
Olmsted: Od	Poor: very poor natural drainage.	Moderate	Poor if not drained; seasonal high water table; good to fair where drained.	Good to fair below a depth of about 5 feet. Poor above a depth of 5 feet.	Poor: very poorly drained. Fair where drained.

interpretations—Continued

Soil features affecting—							
Highway location	Ponds: Reservoir area	Ponds: Embankment	Drainage of crops and pasture	Sprinkler irrigation	Terraces or diversions	Grassed waterways
Susceptible to periodic flooding; moderate susceptibility to frost action; low stability.	Susceptible to overflow; moderate seepage; sandy seams.	Fair stability and compaction; moderate permeability where compacted; poor resistance to piping; sandy seams.	Moderately good drainage; moderate permeability; susceptible to flooding; ditchbanks unstable.	High available water capacity; medium water intake rate; susceptible to flooding.	Generally not needed.	Generally not needed; susceptible to flooding.
Seasonal high water table; clayey, plastic material; difficult to work; high shrink-swell potential.	High water table; slow seepage.	Poor compaction; clayey; difficult to work; very slow permeability where compacted.	Very poor natural drainage; slow permeability; outlets lacking in places.	High available water capacity; medium to slow water intake; very poor drainage.	Dense clayey subsoil; construction difficult; nearly level.	Clayey; difficult to work; very poor drainage; nearly level.
Sandstone at a depth of 20 to 40 inches; slopes of more than 12 percent in places.	Moderately deep to fractured siltstone or sandstone bedrock; high seepage in places.	Fair stability and compaction; moderate permeability where compacted; bedrock at a depth of 20 to 40 inches.	Good natural drainage; seeps in places.	Low to moderate available water capacity; medium water intake rate; slopes of more than 12 percent in places.	Moderately deep to bedrock; slopes of more than 12 percent in places.	Slopes erodible; moderately deep to bedrock.
Seasonal high water table; soil is unstable and tends to flow if wet.	Seasonal high water table; slow to moderate seepage; some sandy seams.	Poor stability; fair compaction; slow permeability where compacted; fair to poor resistance to piping.	Very poor natural drainage; moderately slow permeability; outlets lacking in places.	High available water capacity; medium water intake rate; very poor drainage.	Nearly level; construction is difficult; soil tends to flow if wet.	Nearly level; very poor drainage.
Seasonal high water table; difficult to work; susceptible to seepage; bedrock at a depth of 3½ to 5 feet in places.	Seasonal high water table; slow seepage; bedrock at a depth of 3½ to 5 feet in places.	Fair stability and compaction; slow permeability where compacted; good resistance to piping.	Somewhat poor natural drainage; slow permeability; bedrock at a depth of 3½ to 5 feet in places.	Moderate available water capacity; medium water intake rate; slow permeability; somewhat poorly drained.	Somewhat poorly drained; clayey subsoil; nearly level to gently sloping; many slopes are long.	Nearly level to gently sloping; clayey; difficult to work; somewhat poor drainage.
Very poor natural drainage; difficult to work.	Seasonal high water table; slow seepage.	Fair stability and compaction; slow permeability where compacted; good resistance to piping.	Very poor natural drainage; slow permeability; outlets lacking in places.	High available water capacity; medium water intake rate; slow permeability; very poor drainage.	Nearly level; clayey subsoil difficult to work; very poorly drained.	Nearly level; very poor drainage.
Seasonal high water table; fair workability; moderate susceptibility to frost action.	Seasonal high water table; underlying material is sandy and gravelly; rapid seepage.	Fair stability; fair to good compaction; moderate permeability where compacted.	Very poor natural drainage; moderately rapid permeability; ditchbanks unstable; outlets lacking in places.	High available water capacity; rapid water intake; very poor drainage.	Nearly level; difficult to hold grade in sandy and gravelly material.	Nearly level; very poor drainage; difficult to hold grade in sandy and gravelly material.

TABLE 6.—*Engineering*

Soil series and map symbols	Suitability for winter grading	Susceptibility to frost action	Suitability as a source of— Topsoil	Sand and gravel	Road fill
Orrville: Or, Os	Poor: somewhat poorly drained; susceptible to flooding.	High	Good	Generally not suitable; local deposits of sand at a depth of about 4 feet.	Fair: somewhat poorly drained; bedrock at a depth of 3½ to 5 feet in places.
Oshtemo: OtB	Good: well drained; sandy and gravelly.	Low	Good	Fair to poor: excess fines.	Good
Ravenna: ReA, ReB, RnA. Urban land part of RnA not rated.	Poor: seasonal high water table.	High	Good	Unsuited	Fair: somewhat poorly drained.
Rawson: RoB	Fair to poor: seasonal high water table during extended wet periods.	Moderate	Fair: thin layer.	Unsuited	Fair: loamy material extends to a depth of 2½ feet; clayey material below a depth of 2½ feet.
Rittman: RsB, RsB2, RsC, RsC2, RsE2, RsF.	Fair to poor: seasonal high water table during extended wet periods.	Moderate	Fair: thin layer.	Unsuited	Fair: loamy material; moderate shrink-swell potential; slopes of more than 25 percent in places.
Schaffenaker: ScF	Poor: very steep	Low	Poor: very steep.	Unsuited	Poor: very steep.
Sebring: Sg, St	Poor: seasonal high water table; soft, silty material.	High	Poor during wet periods; fair during dry summer periods.	Unsuited	Poor: poorly drained soil; high susceptibility to frost action; low strength.

interpretations—Continued

Soil features affecting—							
Highway location	Ponds		Drainage of crops and pasture	Sprinkler irrigation	Terraces or diversions	Grassed waterways
	Reservoir area	Embankment					
Seasonal high water table; susceptible to flooding; high susceptibility to frost action; bedrock at a depth of 3½ to 5 feet in places.	Seasonal high water table; susceptible to stream overflow; moderately rapid seepage in some strata.	Poor stability; fair compaction; slow permeability where compacted; fair resistance to piping; contains strata of sand in places.	Somewhat poor natural drainage; moderate permeability in places.	High available water capacity; somewhat poor natural drainage; medium water intake rate.	Generally not needed.	Generally not needed; susceptible to flooding and siltation.
Good natural drainage; sandy and gravelly material; fair stability.	Excessive seepage.	Fair stability and compaction; excess seepage; poor resistance to piping.	Good natural drainage.	Rapid infiltration; low available water capacity.	Not needed; low runoff rate.	Generally not needed; slightly erodible.
Seasonal high water table; fair workability; susceptible to seepage; high susceptibility to frost action.	Seasonal high water table; slow seepage.	Fair to good stability and compaction; slow permeability where compacted.	Somewhat poor natural drainage; slow permeability.	Moderate available water capacity; medium to slow water intake rate; somewhat poor drainage.	Somewhat poor drainage; nearly level to gently sloping; fair workability.	Nearly level to gently sloping; somewhat poorly drained; erodible.
Seasonal high water table of short duration; clayey, plastic material below a depth of about 2½ feet.	High seepage rate in surface layer above a depth of 2½ feet; slow seepage in the underlying clayey material.	Fair stability and compaction; underlying clayey material has very slow permeability but is difficult to work; good resistance to piping.	Moderately good natural drainage; very slow permeability below a depth of about 2½ feet.	Moderate available water capacity; medium intake rate.	Nearly level to gently sloping; fairly easy to work; low runoff rate.	Nearly level to gently sloping; slightly erodible.
Seasonal high water table of short duration; good stability; moderate susceptibility to frost action; susceptible to seepage in cuts; slopes of more than 12 percent in places.	Slow seepage; sloping to very steep.	Good stability and compaction; slow permeability where compacted; good resistance to piping.	Moderately good natural drainage; slow permeability; slopes of more than 12 percent in places.	Moderate available water capacity; medium to slow water intake; slopes of more than 12 percent in places.	Wetness in places; rapid runoff; slopes of more than 12 percent in places.	Slopes erodible; rapid runoff; good workability; seepage in places; slopes of more than 12 percent in places.
Very steep; sandstone at a depth of 20 to 40 inches; sandstone ledges in places.	Excessive seepage.	Poor: stony and rocky material; excess seepage.	Good natural drainage.	Very steep -----	Very steep; sandstone bedrock at a depth of 20 to 40 inches.	Very steep; rapid runoff; sandstone bedrock at a depth of 20 to 40 inches.
Seasonal high water table; low stability; silty material; may flow when wet; material underlying units has good stability.	Seasonal high water table; moderately slow seepage.	Poor stability; fair to poor compaction; poor resistance to piping; erodible.	Poor natural drainage; moderately slow permeability; ditchbanks unstable; outlets lacking in places.	High available water capacity; medium water intake rate; poor drainage.	Generally not needed; soft, silty material that tends to flow when wet; outlets lacking in places.	Nearly level; poor drainage; erodible; grade may be difficult to maintain.

TABLE 6.—*Engineering*

Soil series and map symbols	Suitability for winter grading	Susceptibility to frost action	Suitability as a source of— Topsoil	Sand and gravel	Road fill
Tiro. Mapped only in complex with Bennington soils.	Poor: seasonal high water table.	High	Fair: thin layer.	Unsuited	Fair: seasonal high water table.
Wadsworth: WaA, WaB, WbB. Urban land part of WbB not rated.	Poor: seasonal high water table.	High	Fair: thin layer.	Unsuited	Fair: seasonal high water table.
Wallkill: Wc	Poor: seasonal high water table; organic underlying material.	High	Poor: seasonal high water table.	Unsuited	Poor: low strength.
Willette: Wt	Poor: organic to a depth of 16 to 42 inches; clayey below a depth of 16 to 42 inches; commonly saturated.	High	Fair to good if mixed with mineral material; poor if used alone.	Unsuited	Poor: organic over clayey material.
Wooster: WuB, WuB2, WuC2, WuE2, WuF.	Fair to good: loamy, well drained soil.	Moderate	Good: steep to very steep in places.	Generally not suitable; local deposits may occur below a depth of 5 to 10 feet.	Fair: loamy material; slopes of more than 12 percent in places.

the degree of stoniness. The estimated soil properties and soil features that are important in designing, constructing, and maintaining highways are given in the section, "Engineering Uses of the Soils."

Sanitary landfill.—This is a method of disposing of refuse. The waste is spread in thin layers, compacted, and covered with soil throughout the disposal period. Landfill areas are subject to heavy vehicular traffic. Some soil properties that affect suitability for landfill are ease of excavation, hazard of polluting ground water, and trafficability. The best soils have moderately slow permeability, withstand heavy traffic, and are friable and easy to excavate. For trench-type landfills, unless otherwise stated, the ratings in table 7 apply only to a depth of about 6 feet, and therefore limitation ratings of *slight* or *moderate* may not be valid if trenches are to be much deeper than that. For some soils, reliable predictions can be made to a depth of 10 or 15 feet, but regardless of that, every site should be investigated before it is selected.

Lawns, landscaping, and golf fairways.—In most areas developed for homes and golf courses, the natural surface layer, or topsoil, can be used for lawns, flowers, shrubs, and trees and needs to be saved. It can be re-

interpretations—Continued

Soil features affecting—							
Highway location	Ponds		Drainage of crops and pasture	Sprinkler irrigation	Terraces or diversions	Grassed waterways
	Reservoir area	Embankment					
Seasonal high water table; high potential frost action; susceptible to seepage.	Seasonal high water table; slow seepage.	Fair stability and compaction; slow permeability where compacted; fair resistance to piping; medium to low shear strength.	Somewhat poor natural drainage; slow permeability.	High available water capacity; medium water intake rate; somewhat poorly drained.	Nearly level; generally not needed; fairly easy to work; somewhat poor drainage; seepage in places.	Nearly level; seepage in places; slightly erodible.
Seasonal high water table; high potential frost action; fairly easy to work; susceptible to seepage.	Seasonal high water table; slow seepage.	Fair to good stability and compaction; slow permeability where compacted.	Somewhat poor natural drainage; slow permeability.	Moderate available water capacity; medium water intake rate; somewhat poor drainage.	Nearly level to gently sloping; fairly easy to work; somewhat poor drainage; seepage in places.	Nearly level to gently sloping; slightly erodible; easy to work.
Seasonal high water table; organic underlying material; low stability and strength.	Seasonal high water table; organic underlying material; high seepage.	Moderately slow permeability in mineral soil material; underlying organic material is not suitable.	Poor natural drainage; ditchbanks unstable; outlets lacking in places.	High available water capacity; medium water intake rate; poor drainage.	Generally not needed; poor workability; outlets lacking in places.	Nearly level; poor workability; high water table.
Organic material to a depth of 16 to 42 inches; very low stability; clayey, plastic material in substratum; commonly saturated.	Seasonal high water table; high seepage in organic material; slow seepage in the underlying mineral layers.	Unstable, organic in places; depth of 16 to 42 inches; clayey below a depth of 16 to 42 inches; poor workability.	Very poor natural drainage; slow permeability in clayey material; ditchbanks unstable; outlets lacking in places.	High available water capacity; high water intake rate; very poor drainage.	Generally not needed, unstable material; outlets lacking in places.	Nearly level; high water table; unstable material.
Moderate susceptibility to frost action; easy to work; well drained; good stability; slopes of more than 12 percent in places.	Moderate to moderately slow seepage; gently sloping to very steep.	Good stability and compaction; moderate seepage; slight piping hazard.	Good natural drainage.	Moderate available water capacity; medium water intake rate; well drained soil; slopes of more than 12 percent in places; erodible.	Good natural drainage; easy to work; seepage in places; erodible; slopes of more than 12 percent in places.	Erodible; easy to work; slopes of more than 12 percent in places.

moved from the site, stored until construction and grading are completed, and then returned. The natural surface layer from areas graded for streets also can be saved and used for lawns and fairways. Among the soil properties that determine whether a good lawn or golf fairway can be established are natural drainage, degree of slope, depth to bedrock, texture of the surface layer, stoniness and rockiness, and hazard of flooding.

Playgrounds.—Properties to consider when selecting sites to be used as athletic fields and other intensive play areas include natural drainage, slope, depth to the water table, depth to and kind of bedrock, permeability, degree of stoniness, the hazard of flooding, and the texture of the surface layer. In table 6 the use of fill material from other areas was not considered in the ratings. Soils on flood plains can be used as ball diamonds and other intensive play areas that are not susceptible to costly damage by floodwater and that are not used during normal periods of flooding. The ratings given in table 7 for streets and parking lots are also important when considering the use of soils for tennis courts.

Picnic areas.—Picnic and other extensive play areas

TABLE 7.—*Estimated degree and kinds of limitations*

Soil series and map symbols	Cultivated crops	Septic tank absorption fields	Sewage lagoons	Dwellings: With basements	Dwellings: Without basements	Local roads and streets
Bennington:						
BnA	Slight	Severe: seasonal high water table; slow permeability.	Slight	Severe: seasonal high water table.	Moderate: seasonal high water table.	Severe: high susceptibility to frost action.
BnB	Slight	Severe: seasonal high water table; slow permeability.	Moderate: slope.	Severe: seasonal high water table.	Moderate: seasonal high water table.	Severe: high susceptibility to frost action.
BoA. Ratings are for both Bennington and Tiro parts.	Slight	Severe: seasonal high water table; slow permeability.	Slight	Severe: seasonal high water table.	Moderate: seasonal high water table.	Severe: high susceptibility to frost action.
Berks: BrF	Severe: very steep.	Severe: very steep; bedrock at a depth of 20 to 40 inches.	Severe: very steep; bedrock at a depth of less than 40 inches; moderately rapid permeability.	Severe: very steep.	Severe: very steep.	Severe: very steep.
Bogart: BtA, BtB	Slight	Slight [1]	Severe: moderately rapid permeability.	Moderate: wetness.	Slight	Moderate: moderate susceptibility to frost action.
Canadice: Ca	Severe: wetness.	Severe: seasonal high water table; very slow permeability.	Slight	Severe: poor natural drainage.	Severe: poor natural drainage.	Severe: poor natural drainage; clayey, plastic; difficult to work.
Caneadea: CcA, CcB	Moderate: wetness.	Severe: seasonal high water table; very slow permeability.	Slight	Severe: somewhat poor natural drainage; low strength.	Severe: somewhat poor natural drainage; low strength.	Severe: clayey, plastic; difficult to work; low strength.
Canfield:						
CdA	Slight	Severe: slow permeability.	Slight	Moderate: wetness.	Slight	Moderate: susceptible to frost action.
CdB, CdB2	Slight	Severe: slow permeability.	Moderate: slope.	Moderate: wetness.	Slight	Moderate: susceptible to frost action.
CdC2, CeC. Urban land part of CeC not rated.	Moderate: erodible.	Severe: slow permeability.	Severe: slope	Moderate: wetness; slope.	Moderate: slope.	Moderate: slope; moderate susceptibility to frost action.
Cardington:						
CfB, CgB	Slight	Severe: slow permeability.	Moderate: slope.	Moderate: seasonal high water table.	Slight	Moderate: moderate shrink-swell potential; moderate susceptibility to frost action.

of soils for town and country planning

Sanitary landfill (area type)	Sanitary landfill (trench type)	Lawns, landscaping, and golf fairways	Playgrounds	Picnic areas	Camp areas	Paths and trails
Moderate: seasonal high water table.	Moderate: seasonal high water table.	Moderate: seasonal high water table; slow permeability.	Severe: seasonal high water table.	Moderate: seasonal high water table.	Severe: seasonal high water table.	Moderate: seasonal high water table.
Moderate: seasonal high water table.	Moderate: seasonal high water table.	Moderate: seasonal high water table; slow permeability.	Severe: seasonal high water table.	Moderate: seasonal high water table.	Severe: seasonal high water table.	Moderate: seasonal high water table.
Moderate: seasonal high water table.	Moderate: seasonal high water table.	Moderate: seasonal high water table; slow permeability.	Severe: seasonal high water table.	Moderate: seasonal high water table.	Severe: seasonal high water table.	Moderate: seasonal high water table.
Severe: very steep.	Severe: very steep; bedrock at a depth of less than 40 inches.	Severe: very steep.	Severe: very steep.	Severe: very steep.	Severe: very steep.	Severe: very steep.
Severe: moderately rapid permeability.	Severe: moderately rapid permeability.[1]	Moderate: moderate to low available water capacity.	Moderate: gravel in surface layer; wetness.	Slight	Moderate: wetness.	Slight.
Severe: poor natural drainage.	Severe: poor natural drainage.	Severe: poor natural drainage; very slow permeability.	Severe: poor natural drainage; very slow permeability.	Severe: poor natural drainage.	Severe: poor natural drainage; very slow permeability.	Severe: poor natural drainage.
Severe: seasonal high water table.	Severe: seasonal high water table; clayey.	Severe: very slow permeability.	Severe: very slow permeability; seasonal high water table.	Moderate: somewhat poor natural drainage.	Severe: very slow permeability; seasonal high water table.	Moderate: seasonal high water table.
Slight	Moderate: wetness.	Slight	Moderate: slow permeability.	Slight	Moderate: slow permeability.	Slight.
Slight	Moderate: wetness.	Slight	Moderate: slow permeability; slope.	Slight	Moderate: slow permeability.	Slight.
Moderate: slope.	Moderate: wetness.	Moderate: slope.	Severe: slope	Moderate: slope.	Moderate: slope; slow permeability.	Slight.
Slight	Moderate: seasonal high water table; clayey.	Moderate: moderate available water capacity; slow permeability.	Moderate: slope; slow permeability.	Slight	Moderate: slow permeability.	Slight.

TABLE 7.—*Estimated degree and kinds of limitations*

Soil series and map symbols	Cultivated crops	Septic tank absorption fields	Sewage lagoons	Dwellings: With basements	Dwellings: Without basements	Local roads and streets
Cardington—Con.						
CgC2	Moderate: erodible.	Severe: slow permeability.	Severe: slope	Moderate: seasonal high water table; slope.	Moderate: slope.	Moderate: moderate shrink-swell potential; moderate susceptibility to frost action; slope.
CgE2	Severe: erodible.	Severe: slow permeability; slope.	Severe: slope	Severe: slope	Severe: slope	Severe: slope
Carlisle: Ch	Moderate: wetness.	Severe: high water table.	Severe: organic material; moderately rapid permeability; high water table.	Severe: organic material; high water table.	Severe: organic material; high water table.	Severe: organic material; high water table.
Chagrin: Cm	Slight	Severe: susceptible to flooding.	Severe: susceptible to flooding.	Severe: susceptible to flooding.	Severe: susceptible to flooding.	Severe: susceptible to flooding.
Chili:						
CnA, CpA	Slight	Slight [1]	Severe: rapid permeability.[1]	Slight	Slight	Slight
CnB, CpB, CuB. Urban land part of CuB not rated.	Slight	Slight [1]	Severe: rapid permeability.[1]	Slight	Slight	Slight
CnC, CoC2, CpC	Moderate: slope; erodible.	Moderate: slope.[1]	Severe: rapid permeability; slope.[1]	Moderate: slope.	Moderate: slope.	Moderate: slope.
CoE2	Severe: slope; erodible.	Severe: slope.[1]	Severe: slope; rapid permeability.[1]	Severe: slope	Severe: slope	Severe: slope
CoF2	Severe: slope; erodible.	Severe: slope.[1]	Severe: slope; rapid permeability.[1]	Severe: slope	Severe: slope	Severe: slope
Condit: Cy	Moderate: wetness.	Severe: slow permeability; seasonal high water table.	Slight	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table; high susceptibility to frost action.
Ellsworth:						
ElB, ElB2, EuB. Urban land part of EuB not rated.	Moderate: erodible.	Severe: slow permeability.	Moderate: slope.	Moderate: moderate shrink-swell potential; seasonal wetness.	Moderate: moderate shrink-swell potential; low strength.	Moderate: moderate shrink-swell potential; susceptible to frost action.

of soils for town and country planning—Continued

Sanitary landfill (area type)	Sanitary landfill (trench type)	Lawns, landscaping, and golf fairways	Playgrounds	Picnic areas	Camp areas	Paths and trails
Moderate: slope:	Moderate: seasonal high water table; clayey.	Moderate: moderate available water capacity; slow permeability; slope.	Severe: slope	Moderate: slope.	Moderate: slow permeability; slope.	Slight.
Severe: slope	Moderate: slope; seasonal high water table; clayey.	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Moderate: slope.
Severe: high water table; organic material.	Severe: high water table; organic material.	Severe: high water table.	Severe: organic material; high water table.	Severe: high water table.	Severe: high water table; organic material.	Severe: high water table; organic material.
Severe: susceptible to flooding.	Severe: susceptible to flooding.	Moderate: susceptible to flooding.	Moderate: susceptible to flooding.	Moderate: susceptible to flooding.	Severe: susceptible to flooding.	Slight.
Severe: rapid permeability.[1]	Severe: rapid permeability.[1]	Moderate: low to moderate available water capacity.	Slight	Slight	Slight	Slight.
Severe: rapid permeability.[1]	Severe: rapid permeability.[1]	Moderate: low to moderate available water capacity.	Moderate: slope.	Slight	Slight	Slight.
Severe: rapid permeability.[1]	Severe: rapid permeability.[1]	Moderate: low to moderate available water capacity; slope.	Severe: slope; gravelly in places.	Moderate: slope.	Moderate: slope.	Slight.
Severe: slope; rapid permeability.[1]	Severe: slope; rapid permeability.[1]	Severe: slope	Severe: slope; gravelly.	Severe: slope	Severe: slope	Moderate: slope.
Severe: slope; rapid permeability.[1]	Severe: slope; rapid permeability.[1]	Severe: slope	Severe: slope; gravelly.	Severe: slope	Severe: slope	Severe: slope.
Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.
Slight	Moderate: clayey; wetness.	Moderate: slow permeability.	Moderate: slope; slow permeability.	Slight	Moderate: slow permeability.	Slight.

TABLE 7.—*Estimated degree and kinds of limitations*

Soil series and map symbols	Cultivated crops	Septic tank absorption fields	Sewage lagoons	Dwellings		Local roads and streets
				With basements	Without basements	
Ellsworth—Con.						
EIC, EIC2	Severe: erodible.	Severe: slow permeability.	Severe: slope	Moderate: moderate shrink-swell potential; wetness; slope.	Moderate: moderate shrink-swell potential; low strength; slope.	Moderate: moderate shrink-swell potential; susceptible to frost action; slope.
EIE2	Severe: erodible.	Severe: slope; slow permeability.	Severe: slope	Severe: slope	Severe: slope	Severe: slope
EIF	Severe: erodible.	Severe: slope; slow permeability.	Severe: slope	Severe: slope	Severe: slope	Severe: slope
EsB	Moderate: erodible.	Severe: slow permeability; bedrock at a depth of 3½ to 5 feet.	Moderate: slope; bedrock at a depth of 3½ to 5 feet.	Moderate: moderate shrink-swell potential; wetness.	Moderate: moderate shrink-swell potential; bedrock at a depth of 3½ to 5 feet.	Moderate: susceptible to frost action; moderate shrink-swell potential.
EsC2	Severe: erodible.	Severe: slow permeability; bedrock at a depth of 3½ to 5 feet.	Severe: slope; bedrock at a depth of 3½ to 5 feet.	Moderate: moderate shrink-swell potential; wetness; slope.	Moderate: moderate shrink-swell potential; bedrock at a depth of 3½ to 5 feet; slope.	Moderate: susceptible to frost action; moderate shrink-swell potential; slope.
Fitchville:						
FcA, FcB	Slight	Severe: moderately slow permeability; seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table; low strentgh.	Severe: seasonal high water table; low strength.	Severe: high susceptibility to frost action; soft soil material.
FIA	Slight	Severe: moderately slow permeability; seasonal high water table; susceptible to flooding.	Severe: seasonal high water table; low strength; susceptible to flooding.	Severe: seasonal high water table; low strength; susceptible to flooding.	Severe: seasonal high water table; low strength; susceptible to flooding.	Severe: high susceptibility to frost action; soft soil material; susceptible to flooding.
Geeburg: GbC	Severe: erodible.	Severe: very slow permeability.	Severe: slope	Severe: high shrink-swell potential.	Severe: high shrink-swell potential.	Severe: high shrink-swell potential; low strength.
Glenford:						
GfA, GfB	Slight	Severe: moderately slow permeability.[2]	Moderate: seasonal wetness.[2]	Moderate: seasonal wetness; low strength.	Moderate: low strength.	Severe: high susceptibility to frost action; soft and compressible when wet.
GfC2	Moderate: erodible.	Severe: moderately slow permeability.[2]	Severe: slope.[2]	Moderate: slope; seasonal wetness; low strength.	Moderate: low strength; slope.	Severe: high susceptibility to frost action; soft and compressible when wet.

of soils for town and country planning—Continued

Sanitary landfill (area type)	Sanitary landfill (trench type)	Lawns, landscaping, and golf fairways	Playgrounds	Picnic areas	Camp areas	Paths and trails
Moderate: slope.	Moderate: clayey; wetness.	Moderate: slow permeability; slope.	Severe: slope	Moderate: slope.	Moderate: slow permeability; slope.	Slight.
Severe: slope	Moderate: slope; clayey; wetness.	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Moderate: slope.
Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Slight	Severe: bedrock at a depth of 3½ to 5 feet.	Moderate: slow permeability.	Moderate: slope; slow permeability.	Slight	Moderate: slow permeability.	Slight.
Moderate: slope.	Severe: bedrock at a depth of 3½ to 5 feet.	Moderate: slow permeability; slope.	Severe: slope	Moderate: slope.	Moderate: slow permeability; slope.	Slight.
Moderate: seasonal high water table.	Severe: susceptible to seepage.	Moderate: seasonal high water table.	Severe: seasonal high water table.	Moderate: seasonal high water table.	Severe: seasonal high water table.	Moderate: seasonal high water table.
Severe: susceptible to flooding.	Severe: susceptible to seepage and flooding.	Moderate: seasonal high water table; susceptible to flooding.	Severe: seasonal high water table; susceptible to flooding.	Moderate: seasonal high water table; susceptible to flooding.	Severe: susceptible to flooding.	Moderate: seasonal high water table.
Moderate: slope.	Severe: clayey	Severe: very slow permeability; clayey subsoil; droughty.	Severe: slope; very slow permeability.	Moderate: slope.	Severe: very slow permeability.	Moderate: slope.
Slight	Moderate: seasonal wetness.[2]	Slight	Moderate: seasonal wetness; moderately slow permeability.	Slight	Moderate: moderately slow permeability; seasonal wetness.	Slight.
Moderate: slope.	Moderate: seasonal wetness.[2]	Moderate: slope.	Severe: slope	Moderate: slope.	Moderate: moderately slow permeability; seasonal wetness; slope.	Slight.

TABLE 7.—*Estimated degree and kinds of limitations*

Soil series and map symbols	Cultivated crops	Septic tank absorption fields	Sewage lagoons	Dwellings		Local roads and streets
				With basements	Without basements	
Haskins: HsA, HsB	Slight	Severe: slow permeability in lower part of subsoil and substratum; seasonal high water table.	Severe: seasonal high water table.	Severe: wetness; high shrink-swell potential in lower part of subsoil.	Moderate: wetness.	Moderate: seasonal high water table; low strength.
Holly: Hy	Moderate: wetness; suceptible to flooding.	Severe: high water table; susceptible to flooding.	Severe: susceptible to flooding; high water table.	Severe: susceptible to flooding; high water table.	Severe: susceptible to flooding; high water table.	Severe: high water table; high susceptibility to frost action; susceptible to flooding.
Jimtown: JtA, JtB, Ju. Urban land part of Ju not rated.	Slight	Severe: seasonal high water table.[1]	Severe: moderately rapid permeability.[1]	Severe: seasonal high water table.	Moderate: seasonal high water table.	Moderate: seasonal high water table; moderate susceptibility to frost action.
Linwood: Ld	Slight	Severe: high water table; moderately slow permeability in mineral layers.	Severe: organic material to a depth of 16 to 48 inches; high water table.	Severe: high water table.	Severe: organic material; soft, compressible; high water table.	Severe: organic material; high water table; high susceptibility to frost action; soft material.
Lobdell: Le	Slight	Severe: susceptible to flooding.	Severe: susceptible to flooding; sandy seams in substratum.	Severe: susceptible to flooding.	Severe: susceptible to flooding.	Severe: susceptible to flooding.
Lorain: Ln	Moderate: wetness.	Severe: slow permeability; seasonal high water table.	Slight	Severe: very poor natural drainage; high shrink-swell potential.	Severe: very poor natural drainage; high shrink-swell potential.	Severe: seasonal high water table; high shrink-swell potential; low strength.
Loudonville:						
LoB	Slight	Severe: bedrock at a depth of 20 to 40 inches.	Severe: bedrock at a depth of 20 to 40 inches.	Severe: bedrock at a depth of 20 to 40 inches.	Moderate: bedrock at a depth of 20 to 40 inches.	Moderate: bedrock at a depth of 20 to 40 inches.
LoC, LoC2	Moderate: erodible.	Severe: bedrock at a depth of 20 to 40 inches.	Severe: bedrock at a depth of 20 to 40 inches; slope.	Severe: bedrock at a depth of 20 to 40 inches.	Moderate: bedrock at a depth of 20 to 40 inches; slope.	Moderate: bedrock at a depth of 20 to 40 inches; slope.
LoE2	Severe: erodible.	Severe: bedrock at a depth of 20 to 40 inches; slope.	Severe: bedrock at a depth of 20 to 40 inches; slope.	Severe: bedrock at a depth of 20 to 40 inches; slope.	Moderate: bedrock at a depth of 20 to 40 inches; slope.	Severe: slope
Luray: Ly	Slight	Severe: seasonal high water table; moderately slow permeability.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table; high susceptibility to frost action.

of soils for town and country planning—Continued

Sanitary landfill (area type)	Sanitary landfill (trench type)	Lawns, landscaping, and golf fairways	Playgrounds	Picnic areas	Camp areas	Paths and trails
Moderate: seasonal high water table.	Moderate: seasonal high water table; clayey.	Moderate: seasonal high water table.	Severe: slow permeability in lower part of subsoil; seasonal high water table.	Moderate: seasonal high water table.	Moderate: slow permeability in lower part of subsoil; seasonal high water table.	Moderate: seasonal high water table.
Severe: high water table; susceptible to flooding.	Severe: high water table; susceptible to flooding.	Severe: poor natural drainage; susceptible to flooding.	Severe: high water table; susceptible to flooding.	Severe: high water table; susceptible to flooding.	Severe: high water table; susceptible to flooding.	Severe: high water table; susceptible to flooding.
Severe: moderately rapid permeability.[1]	Severe: moderately rapid permeability.[1]	Moderate: seasonal high water table.	Severe: seasonal high water table.	Moderate: seasonal high water table.	Severe: seasonal high water table.	Moderate: seasonal high water table.
Severe: high water table; organic material.	Severe: high water table; organic material.	Severe: organic material; high water table.	Severe: organic material; high water table.	Severe: organic material; high water table.	Severe: organic material; high water table.	Severe: organic material; high water table.
Severe: susceptible to flooding.	Severe: susceptible to flooding.	Moderate: susceptible to flooding.	Moderate: seasonal high water table; susceptible to flooding.[3]	Moderate: susceptible to flooding.[3]	Severe: susceptible to flooding.	Moderate: susceptible to flooding.[3]
Severe: seasonal high water table.	Severe: seasonal high water table; clayey.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.
Slight	Severe: bedrock at a depth of 20 to 40 inches.	Moderate: bedrock at a depth of 20 to 40 inches.	Moderate: slope; bedrock at a depth of 20 to 40 inches.	Slight	Slight	Slight.
Moderate: slope.	Severe: bedrock at a depth of 20 to 40 inches.	Moderate: bedrock at a depth of 20 to 40 inches; slope.	Severe: slope	Moderate: slope.	Moderate: slope.	Slight.
Severe: slope	Severe: bedrock at a depth of 20 to 40 inches.	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Moderate: slope.
Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.

TABLE 7.—*Estimated degree and kinds of limitations*

Soil series and map symbols	Cultivated crops	Septic tank absorption fields	Sewage lagoons	Dwellings: With basements	Dwellings: Without basements	Local roads and streets
Mahoning: MgA, MnA. Urban land part of MnA not rated.	Moderate: wetness.	Severe: slow to very slow permeability; seasonal high water table.	Slight	Severe: seasonal high water table.	Moderate: seasonal high water table.	Severe: low strength.
MgB	Moderate: wetness.	Severe: slow permeability; seasonal high water table.	Moderate: slope.	Severe: seasonal high water table.	Moderate: seasonal high water table.	Severe: low strength.
MlA, MlB	Moderate: wetness.	Severe: slow permeability; seasonal high water table; bedrock at a depth of 3½ to 5 feet.	Moderate: bedrock at a depth of 3½ to 5 feet.	Severe: seasonal high water table.	Moderate: seasonal high water table.	Severe: low strength.
Miner: Mr	Moderate: wetness.	Severe: seasonal high water table; slow to very slow permeability.	Slight	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table; low strength.
Olmsted: Od	Slight	Severe: seasonal high water table.	Severe: moderately rapid permeability; seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.
Orrville: Or	Slight	Severe: susceptible to flooding; seasonal high water table.	Severe: susceptible to flooding; sandy seams in substratum.	Severe: susceptible to flooding; seasonal high water table.	Severe: susceptible to flooding.	Severe: susceptible to flooding; high susceptibility to frost action.
Os	Slight	Severe: susceptible to flooding; seasonal high water table; bedrock at a depth of 3½ to 5 feet.	Severe: susceptible to flooding; sandy seams in substratum.	Severe: susceptible to flooding; seasonal high water table.	Severe: susceptible to flooding.	Severe: susceptible to flooding; high susceptibility to frost action.
Oshtemo: OtB	Moderate: droughty.	Slight [1]	Severe: moderately rapid permeability.[1]	Slight	Slight	Slight
Ravenna: ReA, RnA. Urban land part of RnA not rated.	Slight	Severe: slow permeability; seasonal high water table.	Slight	Severe: seasonal high water table.	Moderate: seasonal high water table.	Severe: high susceptibility to frost action.
ReB	Slight	Severe: slow permeability; seasonal high water table.	Moderate: slope.	Severe: seasonal high water table.	Moderate: seasonal high water table.	Severe: high susceptibility to frost action.
Rawson: RoB	Slight	Severe: very slow permeability in lower part of subsoil and in substratum.	Moderate: slope.	Severe: high shrink-swell potential; low strength.	Severe: high shrink-swell potential; low strength.	Moderate: moderate susceptibility to frost action; low strength.

of soils for town and country planning—Continued

Sanitary landfill (area type)	Sanitary landfill (trench type)	Lawns, landscaping, and golf fairways	Playgrounds	Picnic areas	Camp areas	Paths and trails
Moderate: seasonal high water table.	Moderate: seasonal high water table; clayey.	Moderate: seasonal high water tabie.	Severe: seasonal high water table; slow to very slow permeability.	Moderate: seasonal high water table.	Severe: seasonal high water table.	Moderate: seasonal high water table.
Moderate: seasonal high water table.	Moderate: seasonal high water table; clayey.	Moderate: seasonal high water table.	Severe: seasonal high water table; slow permeability.	Moderate: seasonal high water table.	Severe: seasonal high water table.	Moderate: seasonal high water table.
Moderate: seasonal high water table.	Severe: bedrock at a depth of 3½ to 5 feet.	Moderate: seasonal high water table.	Severe: seasonal high water table; slow permeability.	Moderate: seasonal high water table.	Severe: seasonal high water table.	Moderate: seasonal high water table.
Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table; slow to very slow permeability.	Severe: seasonal high water table.	Severe: seasonal high water table; slow to very slow permeability.	Severe: seasonal high water table.
Severe: seasonal high water table; moderately rapid permeability in substratum.	Severe: seasonal high water table; moderately rapid permeability in substraum.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.
Severe: susceptible to flooding; seasonal high water table.	Severe: susceptible to flooding; seasonal high water table.	Severe: susceptible to flooding; seasonal high water table.	Severe: susceptible to flooding; seasonal high water table.	Severe: susceptible to flooding; seasonal high water table.	Severe: susceptible to flooding; seasonal high water table.	Severe: susceptible to flooding; seasonal high water table.
Severe: susceptible to flooding; seasonal high water table.	Severe: susceptible to flooding; seasonal high water table; bedrock at a depth of 3½ to 5 feet.	Severe: susceptible to flooding; seasonal high water table.	Severe: susceptible to flooding; seasonal high water table.	Severe: susceptible to flooding; seasonal high water table.	Severe: susceptible to flooding; seasonal high water table.	Severe: susceptible to flooding; seasonal high water table.
Severe: moderately rapid permeability.[1]	Severe: moderately rapid permeability.[1]	Severe: low available water capacity.	Moderate: slope.	Slight	Slight	Slight.
Moderate: seasonal high water table.	Moderate: seasonal high water table; clayey.	Moderate: seasonal high water table; slow permeability.	Severe: seasonal high water table.	Moderate: seasonal high water table.	Severe: seasonal high water table.	Moderate: seasonal high water table.
Moderate: seasonal high water.	Moderate: seasonal high water table; clayey.	Moderate: seasonal high water table; slow permeability.	Severe: seasonal high water table.	Moderate: seasonal high water table.	Severe: seasonal high water table.	Moderate: seasonal high water table.
Slight	Moderate: clayey; seasonal wetness.	Slight	Moderate: slope.	Slight	Slight	Slight.

TABLE 7.—*Estimated degree and kinds of limitations*

Soil series and map symbols	Cultivated crops	Septic tank absorption fields	Sewage lagoons	Dwellings: With basements	Dwellings: Without basements	Local roads and streets
Rittman:						
RsB, RsB2	Slight	Severe: slow permeability.	Moderate: slope.	Moderate: seasonal high water table.	Slight	Moderate: susceptibility to frost action; moderate shrink-swell potential in subsoil.
RsC, RsC2	Moderate: erodible.	Severe: slow permeability.	Severe: slope	Moderate: seasonal high water table; slope.	Moderate: slope.	Moderate: susceptibility to frost action; moderate shrink-swell potential in subsoil; slope.
RsE2	Severe: erodible.	Severe: slow permeability; slope.	Severe: slope	Severe: slope	Severe: slope	Severe: slope
RsF	Severe: erodible.	Severe: slow permeability; slope.	Severe: slope	Severe: slope	Severe: slope	Severe: slope
Schaffenaker: ScF	Severe: slope.	Severe: slope; bedrock at a depth of 20 to 40 inches.	Severe: slope; bedrock at a depth of 20 to 40 inches.	Severe: slope; bedrock at a depth of 20 to 40 inches.	Severe: slope	Severe: slope
Sebring: Sg, St	Moderate: wetness.	Severe: seasonal high water table; moderately slow permeability.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table; high susceptibility to frost action.
Wadsworth:						
WaA	Moderate: wetness.	Severe: seasonal high water table; slow permeability.	Slight	Severe: seasonal high water table.	Moderate: seasonal high water table.	Severe: high susceptibility to frost action.
WaB, WbB. Urban land part of WbB not rated.	Moderate: wetness.	Severe: seasonal high water table; slow permeability.	Moderate: slope.	Severe: seasonal high water table.	Moderate: seasonal high water table.	Severe: high susceptibility to frost action.
Wallkill: Wc	Slight	Severe: high water table.	Severe: high water table; organic material; variable permeability in substratum.	Severe: high water table; low strength.	Severe: high water table; low strength.	Severe: high water table; susceptibility to frost action; soft, compressible material.
Willette: Wt	Moderate: wetness.	Severe: high water table.	Severe: organic material; high water table.	Severe: high water table; low strength.	Severe: high water table; low strength.	Severe: organic material; high water table; high susceptibility to frost action; low strength.

of soils for town and country planning—Continued

Sanitary landfill (area type)	Sanitary landfill (trench type)	Lawns, landscaping, and golf fairways	Playgrounds	Picnic areas	Camp areas	Paths and trails
Slight	Moderate: seasonal wetness; clayey.	Moderate: slow permeability.	Moderate: slow permeability; slope; seasonal wetness.	Slight	Moderate: slow permeability; seasonal wetness.	Slight.
Moderate: slope.	Moderate: seasonal wetness; clayey.	Moderate: slow permeability; slope.	Severe: slope	Moderate: slope.	Moderate: slow permeability; seasonal wetness; slope.	Slight.
Severe: slope	Moderate: seasonal wetness; clayey; slope.	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Moderate: slope.
Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Severe: slope	Severe: slope; bedrock at a depth of 20 to 40 inches.	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.
Moderate: seasonal high water table.	Moderate: seasonal high water table; clayey.	Moderate: seasonal high water table; slow permeability.	Severe: seasonal high water table.	Moderate: seasonal high water table.	Severe: seasonal high water table.	Moderate: seasonal high water table.
Moderate: seasonal high water table.	Moderate: seasonal high water table; clayey.	Moderate: seasonal high water table; slow permeability.	Severe: seasonal high water table.	Moderate: seasonal high water table.	Severe: seasonal high water table.	Moderate: seasonal high water table.
Severe: high water table.	Severe: high water table; organic material.	Severe: high water table.	Severe: high water table.	Severe: high water table.	Severe: high water table.	Severe: high water table.
Severe: high water table.	Severe: high water table; organic material.	Severe: high water table; soft, compressible material.	Severe: organic material; high water table.	Severe: organic material; high water table.	Severe: organic material; high water table.	Severe: organic material; high water table.

TABLE 7.—*Estimated degree and kinds of limitations*

Soil series and map symbols	Cultivated crops	Septic tank absorption fields	Sewage lagoons	Dwellings		Local roads and streets
				With basements	Without basements	
Wooster:						
WuB, WuB2	Slight	Severe: moderately slow permeability.	Moderate: slope.	Slight	Slight	Moderate: susceptible to frost action.
WuC2	Moderate: slope; erodible.	Severe: moderately slow permeability.	Severe: slope	Moderate: slope.	Moderate: slope.	Moderate: slope; moderate susceptibility to frost action.
WuE2	Severe: slope; erodible.	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope
WuF	Severe: slope; erodible.	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope

[1] Hazard of pollution to underground water supplies, springs, and nearby streams exists because of inadequate filtration.
[2] The Glenford soils in Medina County commonly have sandy layers in the substratum that are highly permeable. This feature may affect interpretations in some places for uses involving the substratum.

can be located on many kinds of soil that have severe limitations for most other uses. Flood plains, for example, can be safely developed as extensive play areas. Many areas along streams are scenic, and because they are long and narrow these areas can be used by a relatively large number of people. Considered in rating the soils for picnic and other extensive play areas were the hazard of flooding, degree of stoniness and rockiness, degree of slope, texture of the surface layer, and depth to the water table.

Camp areas.—Sites suitable for tents and trailers should be in areas suitable for use as unsurfaced parking lots for cars and camping trailers. Properties to consider when selecting campsites are a hazard of flooding, a seasonal high water table, permeability, the degree of slope, and soil texture. Soils that have slopes of less than 12 percent are the most desirable for use as tent campsites, but trailers require less sloping soils than tents. Soils that have a medium-textured surface layer have fewer limitations to use as campsites than the very clayey or very sandy soils.

Paths and trails.—This rating applies to soils to be used for local and cross-country footpaths and trails and for bridle paths. It is assumed that these areas will be used as they occur in nature and that little or no soil will be moved. Soil properties considered in rating the soils for this use were the presence of a seasonal high water table, flooding hazard, slope, texture of the surface layer, and rockiness or stoniness.

Descriptions of the Soils

This section describes the soil series and mapping units in Medina County. Each soil series is described in detail, and then, briefly, each mapping unit in that series is described. What is stated about the soil series holds true for the mapping units in that series unless specified differently. Thus, to get full information about any one mapping unit, it is necessary to read both the description of the mapping unit and the description of the soil series to which it belongs.

An important part of the description of each soil series is the soil profile; that is, the sequence of layers from the surface downward to rock or other underlying material. Each series contains two descriptions of this profile. The first is brief and in terms familiar to the layman. The second is much more detailed and is for those who need to make thorough and precise studies of soils. Color terms are for moist soil, unless otherwise stated. The profile described in the series is representative for mapping units in that series. If the profile of a given mapping unit is different from the one described for the series, these differences are stated in describing the mapping unit, or they are differences that are apparent in the name of the mapping unit.

Preceding the name of each mapping unit is a symbol. This symbol identifies the mapping unit on the detailed soil map. Listed at the end of each description of a mapping unit is the capability unit and the woodland suitability group in which the mapping unit has been placed. The page for the description of each capability unit can be found by referring to the "Guide to Mapping Units" at the back of this survey. A discussion of woodland suitability groups is given in the section "Woodland."

The approximate acreage and proportionate extent of each mapping unit are given in table 8. Many of the terms used in describing soils can be found in the Glossary, and more detailed information about the terminology and methods of soil mapping can be obtained from the Soil Survey Manual (*15*).

of soils for town and country planning—Continued

Sanitary landfill (area type)	Sanitary landfill (trench type)	Lawns, landscaping, and golf fairways	Playgrounds	Picnic areas	Camp areas	Paths and trails
Slight	Slight [4]	Slight	Moderate: slope; moderately slow permeability.	Slight	Moderate: moderately slow permeability.	Slight.
Moderate: slope.	Slight [4]	Moderate: slope.	Severe: slope	Moderate: slope.	Moderate: slope; moderately slow permeability.	Slight.
Severe: slope	Moderate: slope.[4]	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Moderate: slope.
Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope.

[3] The rating depends on local duration and frequency of flooding.
[4] In some places, the Wooster soils have bedrock at a depth of 5 to 10 feet.

Bennington Series

The Bennington series consists of nearly level to gently sloping soils that are somewhat poorly drained. These soils formed in glacial till. They are on uplands in the southern and southwestern parts of the county.

In a representative profile the surface layer is dark grayish-brown silt loam 9 inches thick. The subsurface layer is 2 inches of yellowish-brown silt loam. The subsoil consists of 6 inches of grayish-brown, mottled, firm silty clay overlying 11 inches of brown, mottled, very firm silty clay loam. The underlying material, between depths of 28 and 60 inches, is dark-brown, limy clay loam.

Bennington soils have slow permeability in the subsoil and substratum. Available water capacity is moderate. The water table is perched and is commonly at a depth of 1 foot or less during winter and spring. The rooting zone is moderately deep. It is acid in the upper part, unless limed.

Most areas of these soils have been cleared and drained and are used for crops. Response of crops to drainage and fertilizer is good. Productivity potential is moderate once drainage has been established.

Representative profile of Bennington silt loam, 2 to 6 percent slopes, in an alfalfa-grass meadow in Westfield Township, about 0.74 mile east of the town of Westfield Center and along Greenwich Road, 1,200 feet north of Greenwich Road (sample MD–20 in laboratory data section):

Ap—0 to 9 inches, dark grayish-brown (10YR 4/2) silt loam; weak, medium, granular structure; friable; 2 percent coarse fragments; medium acid; abrupt, smooth boundary.

A2—9 to 11 inches, yellowish-brown (10YR 5/4) silt loam; common, fine, distinct, grayish-brown (10YR 5/2) mottles; weak, thick, platy structure parting to weak, fine, subangular blocky; friable; few fine concretions; 2 percent coarse fragments; strongly acid; clear, wavy boundary.

B21t—11 to 17 inches, grayish-brown (10YR 5/2) silty clay; many, fine and medium, faint, yellowish-brown (10YR 5/4) mottles and common, fine, faint, light brownish-gray (10YR 6/2) mottles; moderate, medium, subangular blocky structure; firm; few fine concretions; thin continuous grayish-brown (10YR 5/2) silt coatings; thin very patchy clay films, mainly on vertical surfaces of peds and in pores; 2 percent coarse fragments; very strongly acid; clear, wavy boundary.

B22t—17 to 28 inches, brown (10YR 5/3) silty clay loam; many, medium, faint, grayish-brown (10YR 5/2) mottles and many, medium, distinct, yellowish-brown (10YR 5/6) mottles; weak, coarse, prismatic structure parting to moderate, thick, platy; very firm; medium, continuous, gray (N 5/0) and dark-gray (N 4/0) clay films; dark stains and fine concretions, mainly along faces of peds; 5 percent coarse fragments, mainly sandstone as much as 5 inches in diameter; very strongly acid in upper part and slightly acid in lower part; clear wavy boundary.

C—28 to 60 inches, dark-brown (10YR 4/3) clay loam; many, distinct, gray (10YR 6/1) streaks interfingering throughout; yellowish-brown (10YR 5/6) rinds adjacent to the gray streaks; massive; very firm; less than 5 percent coarse fragments; mildly alkaline; strong effervescence.

The Ap horizon is dark grayish brown (10YR 4/2) or dark brown (10YR 4/3). A thin A2 horizon is present in undisturbed areas and in some cultivated areas. In wooded areas an A1 horizon is common. It is dominantly very dark grayish brown (10YR 3/2) but ranges to black (10YR 2/1). The B2 horizon is dominantly silty clay loam but ranges to silty clay and clay loam. Matrix colors in the B horizon have hue of 10YR to 2.5Y, value of 4 or 5, and chroma of 2 to 4. Depth to carbonates ranges from 26 to 36 inches. Reaction ranges from very strongly acid to strongly acid in the upper part of the B horizon and grades to mildly alkaline in the C horizon. Typically, the soil is 5 percent or less coarse fragments.

TABLE 8.—*Approximate acreage and proportionate extent of the soils*

Soil	Acres	Percent
Bennington silt loam, 0 to 2 percent slopes	6,414	2.4
Bennington silt loam, 2 to 6 percent slopes	16,210	6.0
Bennington-Tiro silt loams, 0 to 2 percent slopes	4,884	1.8
Berks silt loam, 25 to 70 percent slopes	1,140	.4
Bogart loam, 0 to 2 percent slopes	667	.2
Bogart loam, 2 to 6 percent slopes	2,147	.8
Canadice silty clay loam	410	.2
Caneadea silt loam, 0 to 2 percent slopes	709	.3
Caneadea silt loam, 2 to 6 percent slopes	286	.1
Canfield silt loam, 0 to 2 percent slopes	714	.3
Canfield silt loam, 2 to 6 percent slopes	9,288	3.4
Canfield silt loam, 2 to 6 percent slopes, moderately eroded	478	.2
Canfield silt loam, 6 to 12 percent slopes, moderately eroded	459	.2
Canfield-Urban land complex, rolling	796	.3
Cardington fine sandy loam, 2 to 6 percent slopes	270	.1
Cardington silt loam, 2 to 6 percent slopes	10,471	3.9
Cardington silt loam, 6 to 12 percent slopes, moderately eroded	5,414	2.0
Cardington silt loam, 12 to 25 percent slopes, moderately eroded	1,220	.5
Carlisle muck	1,645	.6
Chagrin silt loam	2,098	.8
Chili loam, 0 to 2 percent slopes	329	.1
Chili loam, 2 to 6 percent slopes	2,065	0.8
Chili loam, 6 to 12 percent slopes	215	([1])
Chili gravelly loam, 6 to 12 percent slopes, moderately eroded	864	.3
Chili gravelly loam, 12 to 25 percent slopes, moderately eroded	505	.2
Chili gravelly loam, 25 to 70 percent slopes, moderately eroded	203	([1])
Chili silt loam, 0 to 2 percent slopes	242	([1])
Chili silt loam, 2 to 6 percent slopes	1,461	.6
Chili silt loam, 6 to 12 percent slopes	317	.1
Chili-Urban land complex, undulating	113	([1])
Condit silt loam	4,621	1.7
Ellsworth silt loam, 2 to 6 percent slopes	10,312	3.8
Ellsworth silt loam, 2 to 6 percent slopes, moderately eroded	5,595	2.1
Ellsworth silt loam, 6 to 12 percent slopes	948	.4
Ellsworth silt loam, 6 to 12 percent slopes, moderately eroded	9,680	3.6
Ellsworth silt loam, 12 to 25 percent slopes, moderately eroded	2,670	1.0
Ellsworth silt loam, 25 to 70 percent slopes	3,379	1.2
Ellsworth silt loam, sandstone substratum, 2 to 6 percent slopes	250	([1])
Ellsworth silt loam, sandstone substratum, 6 to 12 percent slopes, moderately eroded	291	.1
Ellsworth-Urban land complex, undulating	808	.3
Fitchville silt loam, 0 to 2 percent slopes	5.212	1.9
Fitchville silt loam, 2 to 6 percent slopes	1,772	.7
Fitchville silt loam, low terrace, 0 to 2 percent slopes	1,551	.6
Geeburg silt loam, 6 to 18 percent slopes	141	([1])
Glenford silt loam, 0 to 2 percent slopes	290	.1
Glenford silt loam, 2 to 6 percent slopes	1,992	.7
Glenford silt loam, 6 to 12 percent slopes, moderately eroded	276	.1
Haskins loam, 0 to 2 percent slopes	1,071	.4
Haskins loam, 2 to 6 percent slopes	487	.2
Holly silt loam	2,179	.8
Jimtown loam, 0 to 2 percent slopes	1,315	0.5
Jimtown loam, 2 to 6 percent slopes	629	.2
Jimtown-Urban land complex	204	([1])
Linwood muck	295	.1
Lobdell silt loam	4,713	1.7
Lorain silty clay loam	1,166	.4
Loudonville silt loam, 2 to 6 percent slopes	704	.3
Loudonville silt loam, 6 to 12 percent slopes	145	([1])
Loudonville silt loam, 6 to 12 percent slopes, moderately eroded	887	.3
Loudonville silt loam, 12 to 25 percent slopes, moderately eroded	1,185	.4
Luray silt loam	1,618	.6
Mahoning silt loam, 0 to 2 percent slopes	23,300	8.6
Mahoning silt loam, 2 to 6 percent slopes	35,406	13.0
Mahoning silt loam, sandstone substratum, 0 to 2 percent slopes	1,275	.5
Mahoning silt loam, sandstone substratum, 2 to 6 percent slopes	1,880	.7
Mahoning-Urban land complex, nearly level	1,937	.7
Miner silty clay loam	922	.3
Olmsted loam	543	.2
Orrville silt loam	9,447	3.5
Orrville silt loam, bedrock substratum	686	.3
Oshtemo sandy loam, 2 to 6 percent slopes	370	.1
Ravenna silt loam, 0 to 2 percent slopes	1,912	.7
Ravenna silt loam, 2 to 6 percent slopes	397	.1
Ravenna-Urban land complex, nearly level	740	.3
Rawson loam, 2 to 6 percent slopes	599	.2
Rittman silt loam, 2 to 6 percent slopes	9,267	3.4
Rittman silt loam, 2 to 6 percent slopes, moderately eroded	5,790	2.1
Rittman silt loam, 6 to 12 percent slopes	486	.2
Rittman silt loam, 6 to 12 percent slopes, moderately eroded	6,522	2.4
Rittman silt loam, 12 to 25 percent slopes, moderately eroded	1,250	.5
Rittman silt loam, 25 to 70 percent slopes	676	.2
Schaffenaker loamy sand, 25 to 70 percent slopes	252	([1])
Sebring silt loam	2,515	.9
Sebring silt loam, till substratum	592	.2
Wadsworth silt loam, 0 to 2 percent slopes	4,810	1.8
Wadsworth silt loam, 2 to 6 percent slopes	7,008	2.6
Wadsworth-Urban land complex, undulating	578	.2
Wallkill silt loam	347	.1
Willette muck	373	.1
Wooster silt loam, 2 to 6 percent slopes	1,945	.7
Wooster silt loam, 2 to 6 percent slopes, moderately eroded	971	.4
Wooster silt loam, 6 to 12 percent slopes, moderately eroded	3,638	1.3
Wooster silt loam, 12 to 25 percent slopes, moderately eroded	683	.3
Wooster silt loam, 25 to 70 percent slopes	290	.1
Cut and fill land	2,622	1.0
Gravel pit	867	.3
Made land	140	([1])
Quarries	96	([1])
Water areas (larger than 40 acres in size)	2,192	.8
Total	271,744	100.0

[1] Less than 0.1 percent.

Bennington soils are the somewhat poorly drained member of the drainage sequence that includes moderately well drained Cardington soils and poorly drained Condit soils. Bennington soils are most commonly adjacent to Cardington soils. They are similar to Mahoning soils, which lie north of the Defiance Moraine, but they lack the moderate to strong prismatic structure of Mahoning soils. They are mapped in a complex with Tiro soils, but they do not have so much silt in the upper part of the solum as Tiro soils. Bennington soils are similar to Caneadea soils, but they formed in glacial till instead of in lacustrine material.

BnA—Bennington silt loam, 0 to 2 percent slopes. This nearly level soil is on uplands throughout the southwestern part of the county. Most areas of this soil are irregular in shape and range from about 5 to 500 acres in size. The larger areas are on broad, flat ground moraines that have a few small depressional pockets and gently sloping knolls.

Included with this soil in mapping are small ponded areas that have a slightly darker colored surface layer and are wetter than is typical of Bennington soils. Also included are a few low knolls that have slopes of slightly more than 2 percent and a few small areas of the more silty Tiro soils.

Erosion is not a major hazard on this soil, but excess water is a concern unless adequate drainage is provided. Surface crusting is likely in cultivated areas. A seasonal high water table and slow permeability are limitations to most nonfarm uses. Capability unit IIw–3; woodland suitability group 2w3.

BnB—Bennington silt loam, 2 to 6 percent slopes. This gently sloping soil has the profile described as representative of the series. Most areas of this soil are 5 to 75 acres in size and are generally irregular in shape.

Included with this soil in mapping are small areas of moderately well drained Cardington soils in the steeper places. These steeper places are commonly more eroded. Also included are spots of wetter soils in depressions or along drainageways. The silt loam surface layer is commonly thicker in these areas of wetter soils.

Seasonal wetness is the major limitation to the use of this soil for farming. There is also a hazard of erosion, because surface runoff is medium. Because of the gentle slopes, both the cropping system and the design of an artificial drainage system for this soil differ slightly from those of the nearly level Bennington soil. Surface crusting is likely in cultivated areas. The seasonal high water table and slow permeability are limitations to most nonfarm uses. Capability unit IIw–3; woodland suitability group 2w3.

BoA—Bennington-Tiro silt loams, 0 to 2 percent slopes. This mapping unit consists of nearly level Bennington and Tiro soils in broad areas that are typically more than 100 acres but less than 600 acres in size. These soils are in a complex pattern in the southwestern part of the county and are so intermingled that they are not separated in mapping. Bennington soils make up about 50 percent of the area, Tiro soils about 30 percent, and less extensive soils the rest.

Bennington soils are mainly on the slightly higher lying areas. Depth to the underlying limy material is slightly more in this Bennington soil than in the profile described as representative of the series; otherwise, the soils are similar.

Tiro soils typically are in depressional areas or in the lower positions on the landscape. A profile of a Tiro soil in this mapping unit is the one described as representative of the Tiro series. In comparison with Bennington soils, the Tiro soils have a higher available water capacity and if adequately drained they are more suitable for cultivation. Also, in subsurface drains, lateral water movement to the tile is more favorable in Tiro soils than in Bennington soils.

Included with these soils in mapping are a few small areas of Fitchville and Sebring soils. In these areas glacial till, instead of water-laid deposits of silt and clay, underlies both the Fitchville and Sebring soils at a depth of about 4 to 5 feet. Also included are a few small areas of Tiro soils in which the thickness of the loamy layer in the subsoil is as much as 30 inches and a few small areas of Glenford soils on knolls.

Seasonal wetness is the main limitation to the use of these soils for crops. Tile is commonly used to provide the drainage needed for most farm uses. Surface crusting is common in cultivated areas. Tiro soils have a high potential frost action. The hazard of erosion is slight to none. A seasonal high water table and slow permeability are limitations to most nonfarm uses. Capability unit IIw–3; woodland suitability group 2w3.

Berks Series

The Berks series consists of well drained, very steep soils that are moderately deep to bedrock. These soils formed in residuum derived from interbedded acid siltstone and shale. They are on side slopes commonly adjacent to deeply entrenched waterways. These soils are scattered throughout the county but are largely in the eastern half.

In a representative profile in a wooded area the surface layer is very dark grayish-brown silt loam 3 inches thick. The subsurface layer is dark-brown and yellowish-brown silt loam 3 inches thick. The subsoil, between depths of 6 and 22 inches, is yellowish-brown, friable and firm channery silt loam. The underlying material, between depths of 22 and 31 inches, is brown very channery silt loam. Shattered siltstone bedrock is at a depth of 31 inches.

Berks soils have moderately rapid permeability. Available water capacity is low. The rooting zone is moderately deep. It is mostly strongly acid to very strongly acid.

Most areas of these soils are in woodland. The very steep slopes largely preclude other uses.

Representative profile of Berks silt loam, 25 to 70 percent slopes, in a wooded area in the northwest corner of Wadsworth Township, about 2,000 feet north of Rimer Road and Boneta Road junction, and about 250 feet west of Boneta Road:

A1—0 to 3 inches, very dark grayish-brown (10YR 3/2) silt loam; weak, fine, granular structure; friable; common roots; 10 percent coarse fragments; strongly acid; clear, wavy boundary.

A&B—3 to 6 inches, dark-brown (10YR 4/3) and yellowish-brown (10YR 5/4) silt loam; weak, fine, subangular blocky structure; friable; common roots; 10 percent coarse fragments; strongly acid; clear, wavy boundary.

B21—6 to 11 inches, yellowish-brown (10YR 5/4) channery silt loam; weak, fine, subangular blocky structure; friable; few roots; thin, patchy, brown

(10YR 4/3) coatings on ped surfaces; 20 percent coarse fragments; very strongly acid; clear, smooth boundary.

B22—11 to 22 inches, yellowish-brown (10YR 5/4) channery silt loam; moderate, medium, subangular blocky structure; firm; few roots; 20 to 25 percent coarse fragments; very strongly acid; gradual, smooth boundary.

C—22 to 31 inches, brown (10YR 5/3) very channery silt loam; massive; firm; few roots; 60 percent coarse fragments; medium acid; gradual, smooth boundary.

R—31 inches, shattered siltstone.

The solum ranges from 20 to 36 inches in thickness. Depth to bedrock ranges from 20 to 40 inches. The A1 horizon is 1 to 3 inches thick and is black (10YR 2/1), very dark brown (10YR 2/2), or very dark grayish brown (10YR 3/2). The B1 horizon, where present, and the B2 horizon have hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 4 to 6. The B2 horizon is mainly channery silt loam. The content of siltstone and sandstone fragments increases from about 10 percent in the A horizon to 60 percent or more in the C horizon.

Reaction is very strongly acid or strongly acid in the solum and ranges from very strongly acid to medium acid in the C horizon. The underlying bedrock is fractured, and these fractures are filled with soil material to a depth of 1 or 2 feet into the bedrock.

Berks soils are on landscape positions similar to those of Loudonville and Schaffenaker soils. They differ from Loudonville soils in having formed in residual material rather than partly in glacial material. They also lack the Bt horizon characteristic of Loudonville soils. Berks soils are less sandy throughout than the Schaffenaker soils, which formed in residuum weathered from sandstone.

BrF—Berks silt loam, 25 to 70 percent slopes. Most areas of this very steep soil are long and narrow in shape and less than about 50 acres in size. Uneven surfaces are common.

Included with this soil in mapping are spots where shale and siltstone outcrop at the surface. The surface layer is commonly shaly or flaggy on these spots. Also included are spots that have more clay in the subsoil than is typical for Berks soils. A few areas contain seep spots.

Very steep slopes are the major limitation to most uses of this soil. High points on the wooded slopes provide scenic overlooks into the valley below. Cleared areas of this soil are a potential source of high amounts of sediment to the adjacent rivers and streams. The very steep slopes and moderate depth to bedrock are the main limitations for most nonfarm uses. Capability unit VIIe-1; woodland suitability group 4f1.

Bogart Series

The Bogart series consists of nearly level to gently sloping, moderately well drained soils. These soils formed in glacial outwash. They are on terraces and kames throughout the county.

In a representative profile in a meadow, the plow layer is brown loam about 9 inches thick. The subsoil is 27 inches thick. The upper 9 inches is strong-brown firm clay loam. The lower 18 inches is brown, firm to friable gravelly sandy loam and sandy loam. Layers between depths of 15 and 36 inches are mottled with grayish brown and yellowish red. The underlying material, to a depth of 60 inches, is brown gravelly loamy sand.

Bogart soils have moderate to moderately rapid permeability. Available water capacity is moderate to low. These soils are saturated with free water for short periods in winter and spring. The water table is apparent. These soils are easily managed, and production of general farm crops and special crops is moderate.

These soils are used for farming, building locations, and as a limited source of sand and gravel.

Representative profile of Bogart loam, 0 to 2 percent slopes, in a meadow field 0.6 mile south of State Route 252 and Myrtle Hill Road intersection, 450 feet east of State Route 252:

Ap—0 to 9 inches, brown (10YR 4/3) loam; weak, medium, granular structure; friable; many roots; 5 percent gravel; medium acid; abrupt, smooth boundary.

B21t—9 to 15 inches, strong-brown (7.5YR 5/6) light clay loam; moderate, medium, subangular blocky structure; firm; common roots; thin continuous yellowish-brown (10YR 5/4) coatings on ped surfaces; thin, very patchy, brown (7.5YR 4/4) clay films bridging sand grains; 5 percent gravel; strongly acid; clear, smooth boundary.

B22t—15 to 18 inches, strong-brown (7.5YR 5/6) light clay loam; common, fine, distinct, grayish-brown (10YR 5/2) mottles; moderate, medium, subangular blocky structure; firm; few roots; thin, patchy, brown (7.5YR 4/4) clay films bridging sand grains; common, fine, black (10YR 2/1) concretions; 10 percent gravel; very strongly acid; clear, smooth boundary.

B23t—18 to 24 inches, brown (7.5YR 4/4) gravelly sandy loam; common, fine, distinct, grayish-brown (10YR 5/2) mottles; moderate, medium, subangular blocky structure; firm; few roots; thin, patchy, brown (7.5YR 4/4) clay bridging sand grains; common, fine, black (10YR 2/1) concretions; 15 percent gravel; very strongly acid; clear, smooth boundary.

B31t—24 to 28 inches, brown (7.5YR 4/4) sandy loam; common, medium, distinct, grayish-brown (10YR 5/2) mottles and common, fine, prominent, yellowish-red (5YR 5/6) mottles; weak coarse subangular blocky structure; firm; few roots; thin, patchy, brown (7.5YR 4/4) clay films bridging sand grains; common, fine, black (10YR 2/1) concretions; 8 percent gravel; medium acid; clear, smooth boundary.

IIB32t—28 to 36 inches, brown (7.5YR 4/4) gravelly sandy loam; common, fine, distinct, grayish-brown (10YR 5/2) mottles and common, fine, prominent, yellowish-red (5YR 4/6) mottles; weak, coarse, subangular blocky structure; friable; few roots; thin, very patchy, brown (7.5YR 4/4) clay films bridging sand grains; few, fine, very dark grayish-brown (10YR 3/2) stains; 30 percent gravel; medium acid; clear, smooth boundary.

IIC—36 to 60 inches, brown (10YR 4/3) gravelly loamy sand; single grained; loose; few roots, 35 percent gravel; neutral.

The solum ranges from 30 to 50 inches in thickness. The Ap horizon is dark grayish brown (10YR 4/2) or brown (10YR 4/3). The B horizon ranges from 20 to 40 inches in thickness. It is brown (7.5YR 4/4), strong brown (7.5YR 5/6), dark yellowish brown (10YR 4/4), and yellowish brown (10YR 5/4 and 5/6) and is loam, clay loam, or sandy loam or gravelly analogs of these textures. Reaction is very strongly acid to medium acid. Calcareous loam to silty clay loam glacial till and lacustrine material are common at a depth of 5 to 7 feet. The content of gravel in the B horizon ranges from 2 to 50 percent, by weight, but averages less than 35 percent.

Bogart soils are most commonly adjacent to the well-drained Chili soils and the somewhat poorly drained Jimtown soils. In places they are adjacent to areas of Glenford, Fitchville, and Oshtemo soils. Bogart soils have less silt and more sand and gravel than Glenford and Fitchville soils. They are more gravelly and are not so well drained as Oshtemo soils.

BtA—Bogart loam, 0 to 2 percent slopes. This nearly level soil is on outwash terraces. Most areas of this soil do not exceed 25 acres in size. This soil has the profile described as representative of the series. Some slightly depressional or concave areas tend to stay wet longer than do slightly convex areas.

Included with this soil in mapping are some small areas of Glenford, Fitchville, and Jimtown soils. In some places the plow layer is silt loam. A few small areas have glacial till or lacustrine silt and clay within a depth of about 3 feet.

Runoff is slow, and the hazard of erosion is little or none. Limitations to the use of this soil for cultivated crops are few, although the soil tends to be droughty during extended dry periods. A seasonal water table is a limitation for some nonfarm uses for short periods late in winter and early in spring. Capability unit IIs–1; woodland suitability group 2o1.

BtB—Bogart loam, 2 to 6 percent slopes. This gently sloping soil is on terraces and kames. Typically, areas of this soil are less than 15 acres in size.

Included with this soil in mapping are small areas of Chili soils on the steeper parts of kames and scattered spots of Glenford soils. Also included are small areas of soils that have a plow layer that is either silt loam, sandy loam, or gravelly loam. A few areas have slopes that are as much as 12 percent and are moderately eroded.

Runoff is slow to medium. Use of this soil for cultivated crops is limited by a moderate hazard of erosion. Also there is a moderate hazard of drought. A seasonal high water table is a limitation for some nonfarm uses for short periods early in spring. Capability unit IIe–1; woodland suitability group 2o1.

Canadice Series

The Canadice series consists of nearly level to slightly depressional, poorly drained soils. These soils formed in water-deposited clayey sediment. They are in areas that were former shallow glacial lakes. These soils are in scattered areas throughout the county, but the largest areas are north of Chippewa Lake.

In a representative profile, the plow layer is dark grayish-brown, mottled silty clay loam 9 inches thick. The subsoil extends to a depth of 55 inches. It is mainly firm, dark-gray and gray, mottled silty clay that is sticky and plastic when wet. The underlying material, to a depth of 70 inches, consists of stratified layers of dark-gray and gray, mottled silty clay and silty clay loam.

Canadice soils have very slow permeability. They are saturated with free water for long periods late in winter, in spring, and early in summer, and they dry out slowly in spring. The water table is perched. The rooting zone is moderately deep when the water table is low. Available water capacity is moderate. Canadice soils are low in organic-matter content, and clods form if the soils are worked when they are too wet.

Most areas of these soils have been cleared. Only a few of these areas are cultivated, because they lack adequate drainage for crops. A few areas are used for late summer pasture. These areas, however, consist mainly of swamp-type vegetation, which is dominated by sedges and cattails.

Representative profile of Canadice silty clay loam, in a cultivated field east of River Styx in Guilford Township, 1,500 feet east of State Route 57, Styx Hill Road, and River Styx Road junction and 400 feet north of State Route 57:

Ap—0 to 9 inches, dark grayish-brown (2.5Y 4/2) light silty clay loam; few, fine, distinct, gray (N 5/0) and dark yellowish-brown (10YR 4/4) mottles; weak, coarse, granular structure; friable, slightly plastic and sticky; many roots; medium acid; abrupt, smooth boundary.

B1g—9 to 13 inches, dark-gray (10YR 4/1) light silty clay; common, medium, distinct, dark-brown (7.5YR 4/4) mottles; weak, medium, subangular blocky structure; firm, plastic and sticky; common roots; few, fine, dark concretions; medium acid; clear, smooth boundary.

B21tg—13 to 22 inches, gray (10YR 5/1) light silty clay; common, fine, distinct, dark-brown (7.5YR 4/4) mottles; moderate, medium, prismatic structure parting to weak, medium, angular blocky; firm, plastic and sticky; few roots; thin, very patchy, gray (10YR 5/1) clay films on ped surfaces and in pores; few, fine, dark concretions; slightly acid; clear, wavy boundary.

B22tg—22 to 38 inches, gray (10YR 5/1) light silty clay; many, coarse, distinct, dark yellowish-brown (10YR 4/4) mottles; moderate, coarse, prismatic structure parting to weak, coarse, angular blocky; firm, plastic and sticky; few roots; thin, patchy, gray (10YR 5/1) clay films on ped surfaces and in pores; few, fine, dark concretions; neutral; clear, wavy boundary.

B31g—38 to 48 inches, gray (N 5/0) silty clay; many, medium, prominent, olive-brown (2.5Y 4/4) and light olive-brown (2.5Y 5/4) mottles; weak, coarse, prismatic structure; firm, plastic and sticky; thin, very patchy, gray (N 5/0) silty coatings in channels and pores, and medium, continuous, gray (N 5/0) silt coatings on vertical ped surfaces; common, fine, dark concretions; neutral; clear, wavy boundary.

B32g—48 to 55 inches, gray (5Y 5/1) silty clay; many, medium and coarse, distinct, olive-brown (2.5Y 4/4) mottles; weak, very coarse, prismatic structure; very firm, plastic and sticky; medium, continuous, gray (N 5/0) silt coatings on vertical ped surfaces; few, fine, dark concretions; neutral; gradual, smooth boundary.

C1g—55 to 61 inches, dark-gray (N 4/0) silty clay; common, medium, distinct, grayish-brown (2.5Y 5/2) mottles; massive; firm, plastic and sticky; neutral; gradual smooth boundary.

C2g—61 to 70 inches, gray (N 5/0) heavy silty clay loam; many, medium, distinct, grayish-brown (2.5Y 5/2) mottles; massive; firm, plastic and sticky; neutral.

The solum ranges from 36 to 60 inches in thickness. Depth to carbonates is typically greater than 50 inches. The solum is less than 2 percent, by volume, coarse fragments. It is strongly acid to neutral. In undisturbed areas the A1 horizon ranges from 1 to 5 inches in thickness and is very dark grayish brown (10YR 3/2), very dark gray (10YR 3/1) or black (10YR 2/1). An A2 horizon 2 to 6 inches thick underlies the A1 horizon and has color value and chroma 1 to 2 units higher than those of the A1 horizon. The Ap horizon is dark gray (10YR 4/1) or dark grayish brown (10YR 4/2 or 2.5Y 4/2). The B2 horizon has hue of 10YR, 2.5Y, or neutral; value of 4 or 5; and chroma of 0, 1, or 2. It is silty clay, clay, and heavy silty clay loam. The C horizon is composed of stratified layers of loamy to clayey material.

Canadice soils are the poorly drained member of a drainage sequence that includes the somewhat poorly drained Caneadea soils and the moderately well drained Geeburg soils. They are commonly adjacent to Caneadea, Lorain, Sebring, Fitchville, and Condit soils. They contain more clay than Sebring, Fitchville, and Condit soils, and they have a lighter colored A horizon than Lorain soils.

Ca—Canadice silty clay loam. This nearly level soil is in swales and in somewhat depressional areas that are commonly dissected by small streams. Most areas are elongated in shape and 5 to 50 acres in size.

Included with this soil in mapping are small shallow depressions that are very poorly drained and have a dark-colored surface layer. In places these shallow depressional areas have a mucky surface layer 1 inch to 6 inches thick. Also included are small areas of Caneadea soils that are in the slightly elevated areas adjacent to drainageways. The Canadice soils that are adjacent to a flowing stream or that are dissected by one commonly contain stratified loamy layers in their profile.

Runoff is slow to ponded. Flooding is common in some places. The seasonal wetness, very slow permeability, and clayey subsoil are limitations to most uses of this soil. Drainage of this soil is difficult. Most areas generally lack natural outlets for drainage. Capability unit IVw-1; woodland suitability group 2w2.

Caneadea Series

The Caneadea series consists of nearly level to gently sloping, somewhat poorly drained soils. These soils formed in lacustrine sediment. They are in areas of postglacial lakebeds, mainly along the East Branch of Black River. Partial dissection of these lakebeds along the river has produced bench levels occupied by Caneadea soils.

In a representative profile in a meadow field, the plow layer is dark grayish-brown silt loam 9 inches thick. The subsoil extends to a depth of 34 inches. The upper 3 inches is dark yellowish-brown, mottled, firm silty clay loam. The next 6 inches is grayish-brown, mottled, very firm silty clay. The lower 16 inches is gray, mottled, very firm silty clay. The underlying material, between depths of 34 and 55 inches, is dark-brown, mottled, very firm silty clay loam. Below this, to a depth of 96 inches, is yellowish-brown, mottled, very firm silt loam.

Caneadea soils have very slow permeability in the subsoil and in the underlying material. Available water capacity is moderate. These soils have a perched high water table in winter, in spring, and early in summer. The rooting zone is mostly moderately deep. It is typically neutral to medium acid.

Most areas of these soils have been cleared and partly drained and are used for crops. Response of crops to drainage and fertilizer is good. The productivity potential is moderate where adequate drainage is provided.

Representative profile of Caneadea silt loam, 0 to 2 percent slopes, in a meadow in Spencer Township, 2,700 feet south of Homer River Corners Road and West Smith Road junction and 1,900 feet west of Homer River Corners Road:

Ap—0 to 9 inches, dark grayish-brown (10YR 4/2) heavy silt loam; moderate, medium, and coarse granular structure; friable; many roots; neutral; abrupt smooth boundary.

B1g—9 to 12 inches, dark yellowish-brown (10YR 4/4) heavy silty clay loam; common, fine, faint, yellowish-brown (10YR 5/6) mottles; weak, medium, subangular blocky structure; firm; slightly plastic and sticky; common roots; thin, continuous, grayish-brown (10YR 5/2) silt coatings on ped surfaces; slightly acid; clear, smooth boundary.

B21tg—12 to 18 inches, grayish-brown (10YR 5/2) silty clay; many, fine, distinct, dark yellowish-brown (10YR 4/4) mottles; moderate, coarse, angular blocky structure; very firm, plastic and sticky; common roots; thin, continuous, gray (10YR 5/1) silt coatings on ped surfaces; thin, very patchy, grayish-brown (10YR 5/2) clay films on ped surfaces and in pores; slightly acid; clear, smooth boundary.

B22tg—18 to 24 inches, gray (10YR 5/1) silty clay; many, medium, distinct, dark yellowish-brown (10YR 4/4) mottles; moderate, coarse, angular blocky structure; very firm, plastic and sticky; few roots; thin, patchy, gray (10YR 5/1) clay films on ped surfaces and in pores; mildly alkaline; clear, wavy boundary.

B3tg—24 to 34 inches, gray (10YR 5/1) silty clay; many, medium, distinct, dark-brown (10YR 4/3) mottles; weak, coarse, prismatic structure parting to weak, coarse, angular blocky; very firm, plastic and sticky; few roots; thin, patchy, gray (10YR 5/1) clay films on ped surfaces and in pores; mildly alkaline; abrupt, irregular boundary.

C1—34 to 55 inches, dark-brown (10YR 4/3) heavy silty clay loam; common, fine, distinct, gray (10YR 5/1) mottles; weak, very coarse, prismatic structure; very firm, slightly plastic and sticky; common, fine, white (10YR 8/2) gypsum crystals; mildly alkaline; strong effervescence; gradual boundary.

IIC2—55 to 96 inches, yellowish-brown (10YR 5/4) silt loam; many, medium, gray (10YR 5/1 and 6/1) mottles; massive; very firm; few, fine, white gypsum crystals; mildly alkaline; strong effervescence.

The Ap horizon is typically dark grayish brown (10YR 4/2) but is grayish brown (10YR 5/2) in places. In undisturbed areas the A1 horizon, 1 to 4 inches thick, is mainly very dark grayish brown (10YR 3/2) but ranges from dark gray (10YR 4/1) to black (10YR 2/1). An A2 horizon, 2 to 6 inches thick, underlies the A1 horizon. It ranges from dark grayish brown (2.5Y 4/2) to brown (10YR 5/3). The B horizon has hue of 10YR to 5Y, value of 4 or 5, and chroma of 1 to 4. It is silty clay loam to silty clay. Reaction ranges from strongly acid to mildly alkaline. The C horizon consists of interstratified lacustrine layers that range from silt loam to silty clay. The thickness of the solum and depth to carbonates ranges from 30 to 60 inches. Coarse fragments range from 0 to about 5 percent.

Caneadea soils are the somewhat poorly drained member of a drainage sequence that includes the poorly drained Canadice soils and the moderately well drained Geeburg soils. They are commonly adjacent to Haskins, Mahoning, and Bennington soils. Caneadea soils formed in lacustrine material rather than in glacial till material of the Mahoning and Bennington soils. They contain less sand in the A horizon and the upper part of the B horizon than Haskins soils.

CeA—Caneadea silt loam, 0 to 2 percent slopes. This nearly level soil is on terraced areas, mainly along the East Branch of Black River. Most areas are circular or oval in shape and less than 50 acres in size. This soil has the profile described as representative of the series.

Included with this soil in mapping are small spots of Haskins soils. Typically these included spots are in level areas that are slightly higher than this Caneadea soil. In some places there are spots where the loamy upper part of the solum is slightly more than 40 inches. Also included are areas of Canadice soils that occupy small depressional areas and areas along drainageways. In some places there are small areas of the adjacent Mahoning and Bennington soils.

Runoff is slow, and ponding is common during periods of heavy rainfall.

Seasonal wetness is the main limitation for farming. The tight, clayey subsoil limits root development. Soil wetness, clayey soil material, and very slow permeability are limitations for many nonfarm uses. Capability unit IIIw–4; woodland suitability group 2w3.

CcB—Caneadea silt loam, 2 to 6 percent slopes. This gently sloping soil is on undulating terraces. The areas are generally less than 50 acres in size and range from circular to irregular in shape.

Included with this soil in mapping are small areas of Haskins soils. Also included are small areas of Jimtown or Mahoning soils, spots of slightly better drained soils, and spots of wetter soils in depressions and along drainageways.

Seasonal wetness is the main limitation of this soil for farming. Erosion is also a concern in most cultivated areas. Seasonal wetness, a clayey subsoil, and very slow permeability are limitations for many nonfarm uses. Capability unit IIIw–4; woodland suitability group 2w3.

Canfield Series

The Canfield series consists of nearly level to sloping, moderately well drained soils that have a fragipan. These soils formed in loamy glacial till. They are on uplands in the eastern part of the county.

In a representative profile in a cultivated area, the plow layer is dark grayish-brown silt loam 9 inches thick. The subsoil extends to a depth of 50 inches. The upper 13 inches is yellowish-brown silt loam or loam. The lower 28 inches is very firm, dense and compact, dark-brown and dark yellowish-brown loam. Below the subsoil, to a depth of 70 inches, is dark-brown loam glacial till.

Canfield soils have moderate permeability above the fragipan and slow permeability in and below the fragipan. During seasonal wet periods, the part of the soil above the fragipan becomes saturated and the perched water moves laterally in sloping areas. The rooting zone of these soils is moderately deep; however, a few roots penetrate the vertical cracks in the fragipan. Available water capacity is low to moderate.

Most areas of Canfield soils are used for crops, but some areas are in residential or woodland use. When cultivated, the main crops are corn, wheat, oats, and grass-legume hay. The potential productivity of these soils is moderate.

Representative profile of Canfield silt loam, 2 to 6 percent slopes, in a cultivated field in Sharon Township, 4,000 feet north of Sharon Center and 500 feet west of State Route 94:

Ap—0 to 9 inches, dark grayish-brown (10YR 4/2) silt loam; weak, medium, granular structure; friable; many roots; 2 percent coarse fragments; strongly acid; abrupt, smooth boundary.

B1—9 to 12 inches, yellowish-brown (10YR 5/4) silt loam; weak, medium, subangular blocky structure; friable; common roots; thin, continuous, pale-brown (10YR 6/3) coatings on ped surfaces; 2 percent coarse fragments; very strongly acid; clear, smooth boundary.

B21t—12 to 18 inches, yellowish-brown (10YR 5/6) heavy silt loam; moderate, medium, subangular blocky structure; firm; few roots; thin, very patchy, dark yellowish-brown (10YR 4/4) clay films; thin, continuous, yellowish-brown (10YR 5/4) coatings on ped surfaces; 5 percent coarse fragments; very strongly acid; clear, wavy boundary.

B22t—18 to 22 inches, yellowish-brown (10YR 5/4) loam; many, medium, distinct, grayish-brown (10YR 5/2) mottles; moderate, medium, subangular blocky structure; firm, few roots; thin, very patchy, dark-brown (10YR 4/3) clay films on ped surfaces; 5 percent coarse fragments; very strongly acid; clear, smooth boundary.

Bx1—22 to 30 inches, dark yellowish-brown (10YR 4/4) loam; many, medium, distinct, yellowish-brown (10YR 5/6) mottles; moderate, very coarse, prismatic structure parting to moderate, medium, platy; very firm; brittle; few roots along ped surfaces; thin, patchy, dark-brown (10YR 4/3) clay films on ped surfaces; thin, continuous, gray (N 6/0) silt coatings on ped surfaces; thin yellowish-brown (10YR 5/6 and 5/8) rind between the gray zone and the interior of the polygons; many, coarse, black (10YR 2/1) stains; 10 percent coarse fragments; strongly acid; gradual, wavy boundary.

Bx2—30 to 42 inches, dark-brown (10YR 4/3) loam; many, medium, distinct, yellowish-brown (10YR 5/6) mottles; moderate, very coarse, prismatic structure parting to moderate, medium, platy; very firm; brittle; few roots along ped surfaces; thin, patchy, dark yellowish-brown (10YR 4/4) clay films on ped surfaces; medium, continuous, gray (10YR 5/1) silt coatings on ped surfaces; thin yellowish-brown (10YR 5/6 and 5/8) rind between the gray zone and the interior of the polygons; common, medium, black (10YR 2/1) stains; 10 percent coarse fragments; medium acid; gradual, wavy boundary.

Bx3—42 to 50 inches, dark-brown (10YR 4/3) loam; many, medium, distinct, yellowish-brown (10YR 5/6) mottles; weak, very coarse, prismatic structure parting to weak, thick, platy; very firm; brittle; few roots along ped surfaces; thin, patchy, dark yellowish-brown (10YR 4/4) clay films on ped surfaces; medium, continuous, gray (10YR 5/1) silt coatings on ped surfaces; thin yellowish-brown (10YR 5/6 and 5/8) rind between the gray zone and the interior of the polygons; common, medium, black (10YR 2/1) stains; 10 percent coarse fragments; slightly acid; gradual, wavy boundary.

C—50 to 70 inches, dark-brown (10YR 4/3) loam; common, medium, distinct, grayish-brown (10YR 5/2) mottles; massive; very firm; common, fine, distinct, gray (10YR 5/1) streaks; 10 percent coarse fragments; neutral.

The solum ranges from 40 to slightly more than 60 inches in thickness. The solum is 2 to 15 percent coarse fragments. It is very strongly acid to medium acid in the upper part and strongly acid to neutral in the lower part. Depth to calcareous material is greater than 60 inches.

The Ap horizon is dark grayish brown (10YR 4/2) or brown (10YR 4/3). Areas that have never been plowed have an A1 horizon 1 to 4 inches thick that is very dark gray (10YR 3/1) or very dark grayish brown (10YR 3/2). The A2 horizon is 2 to 6 inches thick and ranges from dark grayish brown (10YR 4/2) to brown (10YR 5/3).

The B1 horizon is brown (10YR 5/3) or yellowish brown (10YR 5/4). In places the ped surfaces are brown (10YR 5/3) or pale brown (10YR 6/3). The B2 horizon is yellowish-brown (10YR 5/4 or 5/6) or dark yellowish-brown (10YR 4/4) loam and silt loam. The top of the fragipan (Bx horizon) is at a depth of 18 to 28 inches but is typically at a depth of about 22 inches. The fragipan has very coarse, prismatic structure that parts to platy or blocky. Consistence is firm or very firm and brittle. The polygons or prisms have gray (10YR 5/1, 6/1, or N 6/0) to grayish-brown (2.5Y 5/2) silt coatings. A thin, yellowish-brown (10YR 5/6 or 5/8) or strong-brown (7.5YR 5/6 or 5/8) rind is between the gray zone and the interior of the polygons. The polygon interiors are dark brown (10YR 4/3) and dark yellowish brown (10YR 4/4). There are clay

films on the ped surfaces that are intermixed with the silt coatings. The texture is loam or silt loam. The fragipan is 15 to 35 inches thick.

The C horizon is mainly dark brown to brown (10YR 4/3) or dark yellowish brown (10YR 4/4) but ranges to light olive brown (2.5Y 5/4). It is loam, silt loam, or heavy sandy loam. Content of coarse fragments in the C horizon ranges from 10 to 20 percent.

Canfield soils are the moderately well drained member of a drainage sequence that includes the well-drained Wooster soils and the somewhat poorly drained Ravenna soils. They are commonly adjacent to the soils that are in their drainage sequence and to Loudonville soils. They lack bedrock within a depth of 20 to 40 inches, which is common in Loudonville soils. Also they are similar to Rittman soils but they are more loamy and less clayey.

CdA—Canfield silt loam, 0 to 2 percent slopes. This nearly level soil is mostly on oblong ridgetops in areas 10 to 25 acres in size. The drainage of this soil is influenced by either more loamy, less compact underlying material or by sandstone bedrock, which commonly is within 5 to 10 feet of the surface. The glacial till underlying this soil contains more coarse fragments than the till underlying most Canfield soils.

Included with this soil in mapping are a few wet areas that are along drainageways and shallow depressions. These wetter areas are mottled below the plow layer. Also included are spots that have bedrock within a depth of 5 feet. These areas are typically better drained and lack a fragipan.

This soil is well suited to orchards, nursery plants, and commonly grown farm crops. Runoff is slow, and this soil is subject to little or no erosion. Slow permeability and a slight wetness hazard during wet seasons are limitations to farming and to some nonfarm uses of this soil. Capability unit IIw–3; woodland suitability group 1o1.

CdB—Canfield silt loam, 2 to 6 percent slopes. This gently sloping soil is in broad upland areas as much as 500 acres in size. Slopes are typically long and uniform, and there are a few shallow drainageways. This soil has the profile described as representative of the series.

Included with this soil in mapping are a few spots of well-drained Wooster soils, mainly where the slope ranges from 4 to 6 percent or where bedrock is within a depth of 5 to 10 feet. Also included are small spots of the somewhat poorly drained Ravenna soils on flatter parts of the landscape or along the drainageways. Also included are a few spots of soils that have a moderately eroded surface layer.

Runoff is medium. Thus, the hazard of erosion is moderate when this soil is cultivated. Where this soil has long slopes, internal water tends to move laterally above the fragipan and come to the surface as seeps in less sloping areas. Slow permeability is a limitation for many nonfarm uses of this soil. Capability unit IIe–3; woodland suitability group 1o1.

CdB2—Canfield silt loam, 2 to 6 percent slopes, moderately eroded. This gently sloping soil is on side slopes, mainly along drainageways. Most slopes are slightly convex and are oblong to irregular in shape. Most areas are less than 20 acres in size. This soil has a profile similar to the one described as representative of the series, but it is moderately eroded. Erosion has caused a loss of 25 to 75 percent of the original surface layer. This results in less depth to the fragipan, lower organic-matter content in the surface layer, and reduced fertility. Water infiltration is also slower in this soil than in uneroded Canfield soils.

Included with this soil in mapping are small areas of somewhat poorly drained Ravenna soils in depressions and along drainageways. Also included are a few spots of severely eroded soils. These more severely eroded spots have a yellowish-brown surface layer that is mostly subsoil material.

The hazard of additional erosion is the major limitation to the use of this soil for farming. In wet places areas caused by seepage are common. Seasonal wetness, moderate potential frost action, and slow permeability are limitations for many nonfarm uses. Capability unit IIe–3; woodland suitability group 1o1.

CdC2—Canfield silt loam, 6 to 12 percent slopes, moderately eroded. This sloping soil is mainly adjacent to drainageways. The plow layer consists of a mixture of material from the original surface layer and the yellowish-brown subsoil. Erosion has removed about 50 percent of the original surface layer of this soil. More pebbles and stone fragments are on the surface of this soil than on the surface of less eroded Canfield soils. Because of erosion, the surface layer is lower in organic-matter content, and the rooting zone is thinner. This soil is more droughty than uneroded Canfield soils.

Included with this soil in mapping are a few spots of the well-drained Wooster soils and the somewhat poorly drained Ravenna soils.

Water commonly moves downslope through the soil above the fragipan, causing seeps on lower slope. Runoff is rapid, and the hazard of erosion is severe if this soil is cultivated. Slope and slow permeability are the main limitations for many nonfarm uses of this soil. Capability unit IIIe–1; woodland suitability group 1o1.

CeC—Canfield-Urban land complex, rolling. This sloping soil is mainly in the built-up areas in the city of Wadsworth. Grading and digging operations have destroyed or covered much of the normal soil profile. About one-third of this complex is occupied by buildings, streets, and driveways and one-third is mainly cut and fill areas in which the fill areas are dominant. The remaining third consists of relatively undisturbed soils on undeveloped lots and parts of developed lots. Included in this last category are areas that are covered with less than 1 foot of fill material.

The urban land part of this complex consists of those areas that are occupied by buildings, streets, and driveways.

The fill areas are characterized by about 1 foot to 3 feet of fill material overlying mainly Canfield soils. The fill material consists of loamy subsoil and substratum material that was excavated from the nearby cut areas. In turn, the cut areas are characterized by exposed subsoil or substratum material typical of the Canfield soils. The surface layer of the cut and fill areas commonly has a low organic-matter content, and the original structure has been destroyed. The available water capacity is commonly moderate for the fill areas and low for the cut areas. It is difficult to establish and maintain plant growth on cut and fill areas, especially on cut areas that have the dense, compact fragipan or substratum material exposed at the surface.

The characteristics of the soils in the relatively undisturbed areas are similar to those of the Canfield

soils, except for areas where the surface layer is covered with a layer of fill material less than 1 foot thick. In these areas the surface layer tends to become hard when dry, lacks the good physical condition common to the natural surface layer, and is low in organic-matter content. Large amounts of fertilizer, particularly nitrogen, are needed to establish and maintain lawns. The roots of trees and shrubs extend through the thin fill material and into the underlying natural surface layer. Thus, plant growth is generally good.

The hazard of erosion is severe, particularly where the soil is bare of vegetation during construction periods. Runoff is rapid. Downslope seepage is common during wet periods. When the soil is dry, the fragipan is difficult to excavate. Slow permeability, a slight hazard of wetness, moderate potential frost action, and some included spots where bedrock is within a depth of 5 feet are limitations for many nonfarm uses of this complex. Not assigned to a capability unit or woodland suitability group.

Cardington Series

The Cardington series consists of gently sloping to steep, moderately well drained soils. These soils formed in glacial till. They are on hilltops and steeper side slopes in the southern and southwestern parts of the county.

In a representative profile in a cultivated field, the plow layer is dark-brown silt loam 8 inches thick. The subsoil is 24 inches thick. The upper 4 inches is yellowish-brown, friable clay loam. The lower 32 inches is mottled yellowish-brown, dark-brown, and dark grayish-brown, firm and very firm silty clay loam. The underlying material is dark-brown, very firm silty clay loam glacial till.

These soils have slow permeability in the lower part of the subsoil and in the substratum. Available water capacity is moderate. Natural drainage is generally adequate in the upper part of the subsoil during the growing season. During extended wet periods these soils become saturated with free water, but the perched water table represents a low quantity of water. These soils have a moderately deep rooting zone that is acid in the upper part unless limed.

Most areas of these soils have been cleared and used for crops. Many of the more sloping areas along waterways are in woodland. Potential productivity is moderate.

Representative profile of Cardington silt loam, 6 to 12 percent slopes, moderately eroded, in a meadow in Westfield Township, 0.57 mile east of the town of Westfield Center (LeRoy) along Greenwich Road; 1,125 feet north of Greenwich Road, (sample MD–19 in laboratory data section):

Ap—0 to 8 inches, dark-brown (10YR 4/3) silt loam, 30 percent yellowish-brown (10YR 5/4) subsoil material; weak, medium, granular structure, top 3 inches has moderate, fine, granular structure; friable; 5 percent coarse fragments; slightly acid; abrupt, smooth boundary.

B1—8 to 12 inches, yellowish-brown (10YR 5/4) clay loam; moderate, fine and medium, subangular blocky structure; friable; thin, continuous, brown (10YR 5/3) coatings on ped surfaces; 2 percent coarse fragments; medium acid; clear, smooth boundary.

B21t—12 to 17 inches, yellowish-brown (10YR 5/4) silty clay loam; common, fine and medium, distinct, grayish-brown (10YR 5/2) mottles; weak, medium, prismatic structure parting to moderate, medium, subangular blocky; firm; thin, continuous, brown (10YR 5/3) silt coatings; thin, patchy, clay films; 2 percent coarse fragments; very strongly acid; gradual, smooth boundary.

B22t—17 to 28 inches, dark-brown (10YR 4/3) silty clay loam; weak, coarse, prismatic structure parting to strong, medium, angular blocky; firm; medium, continuous, dark-gray (10YR 4/1) clay films on ped surfaces; few, fine and medium, black (10YR 2/1) stains and concretions; 3 percent coarse fragments; medium acid; gradual, wavy boundary.

B3t—28 to 32 inches, dark grayish-brown (10YR 4/2) silty clay loam; weak, coarse, prismatic structure parting to moderate, medium, angular blocky; very firm; few, fine, faint, brown (10YR 4/3) mottles and dark-gray (10YR 4/1) silt coatings; thin, patchy, clay films; 5 percent coarse fragments and a few weathered fragments of limestone; mildly alkaline; gradual, wavy boundary.

C—32 to 75 inches, dark-brown (10YR 4/3) silty clay loam; massive; very firm; grayish-brown (10YR 5/2) silt coatings and distinct light-gray (10YR 7/1) calcareous coatings on primary ped surfaces; 8 percent coarse fragments; mildly alkaline; strong effervescence.

The solum ranges from 28 to 40 inches in thickness. Depth to carbonates ranges from 26 to 40 inches. In undisturbed areas there is a dark-colored A1 horizon and an A2 horizon. Some cultivated, mainly eroded areas lack an A2 horizon. The Ap horizon is mainly dark grayish brown (10YR 4/2) but ranges to brown (10YR 5/3). Texture of the A horizon is silt loam and fine sandy loam. The B horizon has hue of 10YR and 7.5YR, value of 4 or 5, and chroma of 2 to 6. It is silty clay loam and clay loam. Reaction ranges from very strongly acid to medium acid in the upper part of the Bt horizon and from slightly acid to mildly alkaline in the lower part. The C horizon is silty clay loam, clay loam, and heavy silt loam. The average content of coarse fragments throughout the solum is less than 8 percent. These coarse fragments are mainly sandstone and shale and some limestone.

The Cardington soils in Medina County have slightly less clay than Cardington soils mapped elsewhere. This difference does not alter their usefulness and behavior.

The Cardington soils are the moderately well drained member of the drainage sequence that includes the somewhat poorly drained Bennington soils and the poorly drained Condit soils. They differ from the Bennington soils, which are most commonly adjacent, because they are more rolling and have better surface and natural drainage. Cardington soils are similar to Ellsworth and Geeburg soils, but they have a less clayey B horizon than either soil. They also lack the moderate to strong prismatic structure of the Ellsworth soils. Cardington soils formed in glacial till and contain more coarse fragments than Geeburg soils, which formed in lacustrine material.

CfB—Cardington fine sandy loam, 2 to 6 percent slopes. This gently sloping soil is on uplands in the southwestern part of the county. It formed in a thin layer of sandy outwash material and the underlying glacial till. These areas are irregular in shape and less than 20 acres in size. The upper part of the profile of this soil, which ranges in texture from sandy loam or loam to sandy clay loam, is 10 to 24 inches thick. Below this is a layer of silty clay loam that is similar to the subsoil of other Cardington soils.

This soil differs from Cardington silt loam by being more subject to drought during seasonal dry periods, having a lower available water capacity, being less subject to frost action, being easier to cultivate, and being quicker to warm up and dry out in spring.

Included with this soil in mapping are small areas

of soils that have a gravelly surface layer. Also included are small areas of soils that have a loamy layer that is slightly thinner than 10 inches or slightly thicker than 24 inches.

Most areas of this soil are farmed. The hazard of erosion is moderate. Droughtiness is a limitation because the available water capacity is low. Generally, this soil has a lower rate of potassium release than Cardington silt loam. Slow permeability in the lower part of the subsoil is a limitation for some nonfarm uses. Capability unit IIe–3; woodland suitability group 2o1.

CgB—Cardington silt loam, 2 to 6 percent slopes. This gently sloping soil is on uplands throughout the southwestern part of the county. Many areas of this soil are irregular in shape. The size of these areas ranges from about 5 to 300 acres. The larger areas are on broad ridgetops and fairly long, uniform side slopes. The smaller areas are on knolls and along waterways and short side slopes.

This soil is only slightly eroded. Thus, the natural fertility of this soil is higher than that of the more eroded soil described as representative of the series.

Included with this soil in mapping are small areas of the somewhat poorly drained Bennington soils in the lowest areas, some of which are nearly level. Also included are a few areas of moderately eroded soils. These areas have a lighter colored surface layer and commonly are in positions in cultivated fields where runoff is greatest. Some areas of Cardington soils, especially near Lodi, are underlain by sand and gravel at a depth of slightly more than 5 feet. Also, these areas have a profile that is slightly deeper to limy material than is described as representative of the series.

Runoff is moderate to rapid. The hazard of erosion is moderate. Tilth is generally good, but surface crusting is likely in cultivated areas. Seasonal wetness, a clayey subsoil, and slow permeability are limitations for many nonfarm uses of this soil. Capability unit IIe–3; woodland suitability group 2o1.

CgC2—Cardington silt loam, 6 to 12 percent slopes, moderately eroded. This sloping soil is on knolls and short hillside slopes along waterways. Most areas of this soil are oblong in shape and typically are less than 25 acres in size. This soil has the profile described as representative of the series. It differs from less eroded Cardington soils by having a plow layer of lighter colored, heavy silt loam that is a mixture of the original surface layer and material from the subsoil.

Included with this soil in mapping are small, severely eroded spots in which the subsoil is exposed at the surface. These areas are mainly near the crest of the slope or where the slope breaks near the waterways. In some places these slopes are more than 12 percent. Also included are spots of Bennington soils in the less sloping areas.

Runoff is rapid, and in cultivated areas the hazard of erosion is severe. Loss of additional soil material will further reduce the available water capacity and decrease the productivity of this soil. Slope, seasonal wetness, a clayey subsoil, and slow permeability are limitations for many nonfarm uses. Capability unit IIIe–1; woodland suitability group 2o1.

CgE2—Cardington silt loam, 12 to 25 percent slopes, moderately eroded. This moderately steep to steep soil is on short hillsides along waterways that are well entrenched into the landscape. Some of these areas separate different landforms. These areas are typically oblong in shape and are less than 50 acres in size. This soil has lost much of the original surface layer through erosion, and the present plow layer now contains some material from the subsoil. This soil is thinner to the underlying limy till than less eroded Cardington soils. In addition the plow layer is lighter colored, and slightly heavier textured. A few areas of this soil are in woodland and have a darker surface layer.

In cultivated areas tilth is mainly poor and organic-matter content is low. Runoff is rapid, and the hazard of erosion is severe. Slope, slow permeability, and a clayey subsoil are limitations for most nonfarm uses of this soil. Capability unit IVe–3; woodland suitability group 2r1.

Carlisle Series

The Carlisle series consists of nearly level, dark-colored, very poorly drained organic soils. These soils formed in accumulations of partly decomposed remains of trees, fibrous grasses, sedges, and reeds. They are in low-lying, swampy areas throughout the county. The larger areas are in broad bogs near the headwater of major streams. The smaller areas are commonly in kettle holes on the uplands.

In a representative profile the upper 19 inches is black muck. Below this, to a depth of 57 inches, is mostly very dark gray and very dark grayish-brown muck. Between depths of 57 and 138 inches is mostly black muck.

Carlisle soils are typically saturated with water and must be drained before they can be farmed. If adequately drained, these soils have a moderately deep to deep rooting zone. The available water capacity is very high. Permeability is moderately rapid. Productivity is high in the adequately drained areas.

Slightly less than half of the acreage of these soils has been drained and is farmed. These areas are used for potatoes, corn, vegetables, or sod. The remaining areas are in cutover woodland or swamp grasses, sedges, and wetland shrubs.

Representative profile of Carlisle muck, in a cultivated field in Westfield Township, about 2 miles south of Westfield Center, 960 feet east on Garman Road from intersection with County Road 35 (Friendsville Road) and 1,950 feet north of Garman Road:

Oa1—0 to 9 inches, black (N 2/0) broken face and rubbed sapric material; no fiber evident before and after rubbing; moderate, medium, crumb structure; friable; about 25 percent mineral material; pyrophosphate extract dark yellowish brown (10YR 4/4); strongly acid; abrupt, smooth boundary.

Oa2—9 to 19 inches, 90 percent black (10YR 2/1) and 10 percent dark reddish-brown (5YR 3/2) broken face, black (5Y 2/1) rubbed sapric material; 15 to 20 percent fiber, but less than 5 percent rubbed; weak, coarse, prismatic structure; friable; about 20 percent mineral material; pyrophosphate extract light yellowish brown (10YR 6/4); strongly acid; clear smooth boundary.

Oa3—19 to 32 inches, 85 percent very dark grayish-brown (10YR 3/2) and 15 percent dark-brown (7.5YR 3/2) broken face, very dark grayish-brown (10YR 3/2) rubbed sapric material; about 35 percent

fiber, 5 percent rubbed; massive; friable; about 20 percent mineral material; pyrophosphate extract very pale brown (10YR 7/3); strongly acid; clear, smooth boundary.

Oa4—32 to 41 inches, 85 percent very dark gray (10YR 3/1) and 15 percent very dark grayish-brown (10YR 3/2) broken face, very dark gray (10YR 3/1) rubbed sapric material; about 50 percent fiber, 5 to 10 percent rubbed; massive; friable; about 20 percent mineral material; pyrophosphate extract light yellowish brown (10YR 6/4); strongly acid; clear, smooth boundary.

Oa5—41 to 57 inches, 90 percent very dark gray (10YR 3/1) and 10 percent very dark grayish-brown (10YR 3/2) broken face, very dark gray (10YR 3/1) rubbed sapric material; 35 to 40 percent fiber, less than 5 percent rubbed; massive; friable; about 20 percent mineral material; pyrophosphate extract very pale brown (10YR 7/3); medium acid; clear, smooth boundary.

Oa6—57 to 62 inches, 90 percent black (N 2/0) and 10 percent very dark gray (10YR 3/1) broken face, black (N 2/0) rubbed sapric material; 10 to 15 percent fiber, trace rubbed; massive; friable; about 20 percent mineral material; pyrophosphate extract light yellowish brown (10YR 6/4); medium acid; clear, smooth boundary.

Oa7—62 to 70 inches, 80 percent black (N 2/0) and 20 percent very dark grayish-brown (10YR 3/2) broken face, black (N 2/0) rubbed sapric material; about 15 percent fiber, trace rubbed; massive; friable; about 20 percent mineral material; pyrophosphate extract yellowish brown (10YR 5/4); medium acid; clear, smooth boundary.

Oa8—70 to 81 inches, 70 percent black (N 2/0) and 30 percent dark-brown (7.5YR 3/2) broken face, black (N 2/0) rubbed sapric material; about 40 percent fiber, 5 to 10 percent rubbed; massive; friable; pyrophosphate extract light yellowish brown (10YR 6/4); about 10 percent woody fragments; slightly acid; clear, smooth boundary.

Oe1—81 to 88 inches, 75 percent dark-brown (7.5YR 3/2) and 25 percent black (N 2/0) broken face, and dark-brown (7.5YR 3/2) rubbed hemic material; 60 to 70 percent fiber, 25 percent rubbed; massive; friable; 15 percent mineral material; pyrophosphate extract yellowish-brown (10YR 5/4); clear, smooth boundary.

Oe2—88 to 138 inches, 75 percent black (N 2/0) and 25 percent dark-brown (10YR 3/3) broken face, dark-brown (7.5YR 3/2) rubbed hemic material; 40 to 50 percent fiber, 15 percent rubbed; massive; friable; 20 percent mineral material; moderately alkaline.

Total thickness of the organic layers exceeds 51 inches. The color of the Oa1 horizon ranges from black (N 2/1) to very dark brown (10YR 2/2). The color of the horizons between the depths of 9 to 60 inches is dominantly black (10YR 2/1) and very dark grayish brown (10YR 3/2), but in places they also have hue of 7.5YR, 5YR, or N, value of 2 or 3, and chroma of 0 to 3. The reaction of the surface tier ranges from strongly acid to neutral. The material below a depth of 19 inches is generally higher in fiber content than the material above, but it seldom exceeds 10 percent if rubbed. Wood fragments in the lower part of the profile are common.

Carlisle soils are on landscape positions similar to those of very poorly drained Lorain, Linwood, Luray, Olmsted, and Willette soils. Carlisle soils have greater thickness of organic material than Linwood or Willette soils. They are organic soils in contrast to Lorain, Luray, and Olmsted soils, which are mineral soils.

Ch—Carlisle muck. This nearly level soil occupies areas that are as much as 400 acres in size but are mainly 5 to 20 acres. The large areas are mainly oblong. The small areas are in kettle holes on uplands and are roughly circular. Typically, a compact, very slowly permeable mineral soil is at a depth of 5 to 10 feet.

Included with this soil in mapping are a few areas of Linwood, Wallkill, and Willette soils. Also included are small areas of soils that have thin layers of loamy outwash material interstratified with the organic material. A fairly large area of Carlisle muck is along Granger Ditch in Granger Township. About a third of this muck area, the area that lies mainly north of the Granger Ditch channel, has a profile that has a higher fiber content than does the profile that is described as representative of the series.

This swampy soil is too wet for most uses unless it is drained. The drained areas are subject to subsidence as the result of oxidation of the organic material, and, where dry, they are subject to severe soil blowing and damage by fire. If drained, the soil is well suited to corn, vegetables, and sod, but crop production requires intensive management. This soil is also suitable for irrigation. Small grain is not well suited, because it is subject to severe lodging and the grain harvest is generally low.

Wetness is the main limitation to the use of this soil for crops. Also, this soil is highly unstable for structures. Wetness and instability are limitations for most nonfarm uses. Capability unit IIIw-3; woodland suitability group 5w1.

Chagrin Series

The Chagrin series consists of nearly level, well-drained soils. These soils formed in alluvium washed from nearby uplands. They are on flood plains throughout the county.

In a representative profile the surface layer is dark grayish-brown silt loam 8 inches thick. Between depths of 8 and 38 inches is dark yellowish-brown friable silt loam. The underlying material, to a depth of 60 inches, is mottled, brown silt loam.

Chagrin soils have moderate permeability. Available water capacity is high. These soils have a deep rooting zone. They are susceptible to occasional flooding.

These soils are used mainly for farming. They have a high potential productivity.

Representative profile of Chagrin silt loam in crops in Liverpool Township, about three-fourths mile south of Grafton Road and West River Road junction and about 300 feet east of West River Road:

Ap—0 to 8 inches, dark grayish-brown (10YR 4/2) silt loam; moderate, medium, granular structure; friable; neutral; abrupt, smooth boundary.

B21—8 to 16 inches, dark yellowish-brown (10YR 4/4) silt loam; weak, medium, subangular blocky structure; friable; thin, continuous, brown (10YR 4/3) coatings on ped surfaces; thin, continuous, dark grayish-brown (10YR 4/2) coatings on worm and root channels; neutral; clear, wavy boundary.

B22—16 to 38 inches, dark yellowish-brown (10YR 4/4) silt loam; weak, coarse, subangular blocky structure; friable; thin, continuous, brown (10YR 4/3) coatings on ped surfaces; thin, continuous, dark grayish-brown (10YR 4/2) coatings on worm and root channels; slightly acid; gradual, smooth boundary.

C—38 to 60 inches, brown (10YR 4/3) silt loam; many, fine, distinct, light brownish-gray (10YR 6/2) mottles and many, medium, distinct, yellowish-brown (10YR 5/6) mottles; massive; friable; neutral.

Reaction, to a depth of 40 inches, is medium acid to neutral. The A or Ap horizon is dark grayish brown (10YR 4/2), dark brown (10YR 4/3), and very dark grayish brown (10YR 3/2) and crushes to dark grayish brown (10YR 4/2). The B horizon is silt loam or loam. Thin layers of sandy loam are in some profiles. The B horizon has hue of 10YR and 7.5YR, value of 4 or 5, and chroma of 3 or 4. Coatings of dark grayish brown (10YR 4/2) and brown (10YR 4/3) on the root and worm channels and on the ped surfaces are common in most profiles. Mottles that have chroma of 2 are common below a depth of 30 inches. The C horizon is commonly stratified sandy loam to light silty clay loam.

Chagrin soils are generally adjacent to the moderately well drained Lobdell soils or to the somewhat poorer drained Orrville soils. They are generally near the main stream channel, but Lobdell and Orrville soils are near the uplands. In places they are adjacent to poorly drained Holly soils.

Cm—Chagrin silt loam. This nearly level soil commonly is in long, narrow areas on the flood plains. The size of these areas is variable.

Included with this soil in mapping are small areas of soils that have a sandy or gravelly surface layer and subsurface layer. These areas have a slightly lower available water capacity. Also, in few places bedrock or channery soil layers start at a depth of about 30 inches. These places are commonly in narrow stream valleys and where the stream channel has cut down to and is running on bedrock. Also included are a few small areas of Lobdell and Orrville soils.

Areas of this soil on the narrow flood plains are generally in woodland or pasture, but the wider areas are used for cultivated crops. Runoff is slow, and erosion is not a hazard. Flooding that is common late in winter and in spring is the main limitation for most farm and nonfarm uses of this soil. Capability unit IIw-2; woodland suitability group 1o1.

Chili Series

The Chili series consists of nearly level to very steep, well-drained soils. These soils formed in loamy material that is underlain by layers of gravelly and sandy glacial outwash. They are on terraces and kames throughout the county.

In a representative profile in a cultivated area, the surface layer is brown loam about 9 inches thick. The subsoil, between depths of 9 and 53 inches, is dark-brown and brown, friable to firm loam to gravelly clay loam. The underlying material, between depths of 53 and 60 inches, is dark-brown loamy sand.

Chili soils have moderately rapid permeability in the subsoil and rapid permeability in the underlying material. Available water capacity ranges from moderate to low. These soils tend to be droughty during periods of low rainfall. They warm up and dry out early in spring and lack a seasonal high water table. These soils have a moderately deep rooting zone.

The less steep areas of Chili soils are used mainly for corn, wheat, and hay, and the steeper areas are in pasture or trees. The areas that are more nearly level are suited to irrigation and specialized crops.

Representative profile of Chili loam, 2 to 6 percent slopes, in a cultivated field in Westfield Township, 150 feet west of Daniels Road, 550 feet north of intersection of Daniels Road and Mud Lake Road:

Ap—0 to 9 inches, brown (10YR 4/3) loam; weak, fine, granular structure; friable; 5 percent gravel; neutral; abrupt, smooth boundary.

B1—9 to 13 inches, dark-brown (7.5YR 4/4) loam; weak, fine, subangular blocky structure; friable; thin, very patchy, dark yellowish-brown (10YR 4/4) clay films on ped surfaces; 10 percent gravel; slightly acid; clear, smooth boundary.

B21t—13 to 21 inches, dark-brown (7.5YR 4/4) fine gravelly loam; moderate, medium, subangular blocky structure; friable; thin, patchy clay films on ped surfaces; 15 to 20 percent gravel; slightly acid; clear, smooth boundary.

B22t—21 to 29 inches, dark-brown (7.5YR 4/4) light gravelly clay loam; weak, medium, subangular blocky structure; firm; thin, patchy clay films on ped surfaces; 20 to 25 percent gravel; medium acid; clear, smooth boundary.

B23t—29 to 35 inches, dark brown (7.5YR 4/4) light gravelly clay loam; common, fine, distinct, yellowish-red (5YR 5/6) mottles; weak, medium, subangular blocky structure; firm; thin, patchy clay films on ped surfaces; 25 percent gravel; strongly acid; clear, smooth boundary.

B3—35 to 53 inches, brown (10YR 4/3) light gravelly clay loam; many, fine, prominent, dark reddish-brown (5YR 3/3) mottles; weak, coarse, subangular blocky structure; firm; 25 percent gravel; strongly acid; clear, wavy boundary.

C—53 to 60 inches, dark-brown (7.5YR 4/4) loamy sand; few, fine, distinct, light brownish-gray (10YR 6/2) mottles; single grained; slightly acid.

The profile has a silt mantle 0 to 24 inches thick. The solum is 40 to 55 inches thick. Slightly acid, neutral, or calcareous material is at a depth of more than 55 inches. In places the C horizon is acid to a depth of more than 10 feet.

The Ap horizon ranges from dark grayish brown (10YR 4/2) to brown or dark brown (10YR 4/3). In an undisturbed profile, the A1 horizon ranges from 1 inch to 4 inches in thickness and is very dark grayish brown (10YR 3/2) to very dark brown (10YR 2/2). An A2 horizon that is 1 inch to 5 inches in thickness underlies the A1 horizon in most places. The A2 horizon has value of 4 or 5 and chroma of 3 or 4. The A horizon is loam, silt loam, and gravelly loam. The B2t horizon ranges from dark yellowish brown (10YR 4/4) to reddish brown (5YR 4/4), and reaction ranges from very strongly acid to medium acid, except for places influenced by surface liming. The B horizon ranges from sandy loam to light clay loam and gravelly analogs of these textures. In places it is silt loam in the upper part. The gravel content in the Bt horizon ranges from about 5 to 40 percent.

Chili soils are in the same drainage sequence as the moderately well drained Bogart soils, the somewhat poorly drained Jimtown soils, and the very poorly drained Olmsted soils. They lack grayish mottles and typically are more gravelly than any of these soils. They also have a lighter colored A horizon than the Olmsted soils. The B horizon of Chili soils contains more gravel and shows stronger profile development than that of the nearby Oshtemo soils.

CnA—Chili loam, 0 to 2 percent slopes. This nearly level soil is on terraces. Areas are mainly oblong and less than 15 acres in size.

Included with this soil in mapping are small areas of the slightly wetter Bogart soils. In some places the surface layer is sandy loam, gravelly loam, or gravelly sandy loam.

The main limitation to the use of this soil for crops is droughtiness. There is little or no runoff because water moves readily into this soil and slopes are nearly level. This soil has few limitations for most nonfarm uses. Capability unit IIs-1; woodland suitability group 2o1.

CnB—Chili loam, 2 to 6 percent slopes. This gently sloping soil is on terraces and on broad, fairly low kames, mainly in areas that are nearly circular and

less than 10 acres in size. It has the profile described as representative of the series. The larger areas are generally oblong and are as large as 40 acres.

Included with this soil in mapping are small areas of moderately well drained Bogart soils and somewhat poorly drained Jimtown soils, which occur in some of the depressional pockets. In places small areas of soils have a surface layer of sandy loam, gravelly loam or gravelly sandy loam.

A moderate hazard of erosion is the main limitation to use of this soil for crops. Even though this soil takes in water readily, runoff is common during periods of high, intensive rainfall. Droughtiness is also a limitation. Slope and the hazard of erosion are limitations for some nonfarm uses. Capability unit IIe–1; woodland suitability group 2o1.

CnC—Chili loam, 6 to 12 percent slopes. This sloping soil is on rolling kames and on slope breaks along the edge of terraces. The kames are circular and are less than 10 acres in size. On the terraces this soil is narrow and oblong in shape and less than 15 acres in size. It typically contains more sand and gravel in the surface layer, and the subsoil tends to be more droughty than other less sloping Chili soils. Also, the average thickness of the surface layer and subsoil is less than that in the profile described as representative of the series.

Included with this soil in mapping are small areas of eroded Chili soils that have a gravelly surface layer. Also included are a few areas of soils that lack gravelly texture throughout.

Use of this soil for farming is limited mainly by a severe hazard of erosion. Droughtiness is a concern during dry periods in summer. Also, slope is a limitation for some nonfarm uses. Capability unit IIIe–2; woodland suitability group 2o1.

CoC2—Chili gravelly loam, 6 to 12 percent slopes, moderately eroded. This gravelly soil is on rolling kames and slope breaks along the edge of terraces. Many of the kames are nearly circular and range in size from 3 to 10 acres. The terraces are typically irregular in shape. This soil is also in elongated areas that separate the terraces from adjacent landforms. Areas of this soil on terraces are commonly less than 15 acres in size. This soil has a profile that differs from the one described as representative of the series by having an eroded surface layer. The plow layer is a mixture of the original surface layer and material from the subsoil. Thus, the organic-matter content, natural fertility, and available water capacity are less in this soil. In addition the surface layer is 20 percent or more pebbles.

Included with this soil in mapping in a few places are areas of severely eroded soils that have a lighter colored, very gravelly surface layer. Also included are small areas of soils that have a higher content of sand in the upper part of the subsoil than does the profile that is described as representative of the series.

Although this soil takes in water readily, slope causes a severe hazard of erosion in cultivated areas. If erosion is controlled, this soil is suited to most commonly grown crops and to many specialized crops. Droughtiness is a secondary limitation. Also, the gravelly texture of this soil causes rapid wearing to tillage implements. Slope is a limitation for many nonfarm uses. Capability unit IIIe–2; woodland suitability group 2o1.

CoE2—Chili gravelly loam, 12 to 25 percent slopes, moderately eroded. This moderately steep to steep soil is in rolling, hummocky areas and on terrace escarpments. Most areas of this soil are less than 15 acres in size. The gravelly plow layer in most areas consists of a mixture of the original surface layer and part of the subsoil. The organic-matter content and available water capacity are less in this soil than in other less gravelly and less sloping Chili soils.

Included with this soil in mapping are a few areas of soils that lack a gravelly surface layer and subsoil.

The hazard of erosion is the main limitation to the use of this soil for farming. Droughtiness is also a limitation because the available water capacity of this soil is low. Use of this soil for cultivated crops is limited. Slope is the dominant limitation for most nonfarm uses. Capability unit IVe–2; woodland suitability group 2r1.

CoF2—Chili gravelly loam, 25 to 70 percent slopes, moderately eroded. This very steep soil is on narrow terrace escarpments. Slopes are mainly more than 35 percent. Most areas are less than 20 acres in size. The surface layer and subsoil are not so thick as those in the profile described as representative of the series. Also, this soil has a higher content of gravel and an eroded surface layer.

Included with this soil in mapping are a few spots of soils that have a sandy profile and contain a small amount of gravel.

Slope is the main limitation for both farm and nonfarm uses of this soil. Capability unit VIIe–2; woodland suitability group 2r2.

CpA—Chili silt loam, 0 to 2 percent slopes. This nearly level soil is on terraces. Most areas of this soil are less than 10 acres in size, but a few areas are as large as 30 acres. Areas commonly are oblong. This soil has a profile similar to the one described as representative of the series, but the surface layer and the upper part of the subsoil have a higher silt content. Also, this soil has a higher available water capacity and is more productive.

Included with this soil in mapping are a few small places where the more silty layers extend to a depth of about 40 inches.

Runoff is slow, and water moves readily into this soil. Droughtiness is the major limitation to the use of this soil for farming. This soil, however, is less droughty than either Chili loam or Chili gravelly loam, but the silt loam surface layer has a greater tendency to crust. This soil has no major limitations for most nonfarm uses. Capability unit IIs–1; woodland suitability group 2o1.

CpB—Chili silt loam, 2 to 6 percent slopes. This gently sloping soil is in undulating areas on terraces. Most areas of this soil are somewhat circular in shape and less than 10 acres in size; however, some areas are irregular in shape and range from 15 acres to about 40 acres in size. The surface layer and the upper part of the subsoil have a higher silt content than those of the profile described as representative of the series. The silt mantle on this soil is commonly 8 to 24 inches thick. This soil has a higher available water capacity than Chili loams or gravelly loams.

Included with this soil in mapping are a few small eroded places in the steeper areas. The silty surface layer is less than 12 inches thick in these places, and the plow layer is a mixture of the original surface layer and material from the subsoil. At the base of some slopes and in depressional areas are included places that have a silty surface layer greater than 24 inches thick.

Runoff is medium. The hazard of erosion is moderate where this soil is cultivated. Other than slope, this soil has few limitations to most nonfarm uses. Capability unit IIe–1; woodland suitability group 2o1.

CpC—Chili silt loam, 6 to 12 percent slopes. This sloping soil is in areas on terraces that are irregular in shape and less than 10 acres in size. They commonly are on landscape breaks that separate the less sloping Chili silt loam from the lower lying landscape areas. The silt mantle in this soil is generally less than 14 inches thick. The available water capacity is only slightly higher than that of the Chili loam soil that has a profile described as representative of the series.

Included with this soil in mapping are areas of moderately eroded soils. These eroded soils are thinner to sand and gravel and are more droughty. Also included are a few small areas of soils that have a surface layer of gravelly silt loam or loam.

Runoff is rapid. The hazard of erosion is severe where this soil is cultivated. Slope is the dominant limitation for most nonfarm uses. Capability unit IIIe–2; woodland suitability group 2o1.

CuB—Chili-Urban land complex, undulating. This gently sloping soil is mainly in the villages of Lodi and Seville. It consists of areas of Chili soils that have been partly disturbed as a result of grading and digging. These areas consist of about one-third urban land which is occupied by buildings, streets, and driveways. Another third is composed mainly of fill areas. These are areas that have received the soil material that was excavated from the construction of buildings and streets. The rest consists of relatively undisturbed Chili soils on undeveloped lots and parts of developed lots. Also included in this third category are areas that are covered with less than 1 foot of fill material. The fill areas are characterized by about 1 foot to 3 feet of fill material overlying Chili soils. The fill material consists of loamy material from the subsoil and substratum of Chili soils. In places this loamy material has variable texture caused by stratification of sandy and gravelly material in the substratum.

Included with this complex in mapping is one area in the city of Lodi that is nearly level. Also included are small areas of cut land. They are characterized by having part or all of the subsoil material removed during the grading operation. Thus, these areas now have, subsoil or substratum material exposed at the surface.

The surface layer of the soils in the fill and cut areas is commonly low in organic-matter content and available water capacity. Thus, large amounts of fertilizer and the timely application of water are needed to establish and maintain good lawns.

The soils in relatively undisturbed areas have a profile similar to the one described as representative of the Chili series, except for those areas where the surface layer is covered with a thin (less than 1 foot thick) layer of fill material. In these areas the surface layer is lower in organic-matter content and available water capacity than the underlying natural surface layer. This fill material is less desirable for the establishment and maintenance of lawns. Tree and shrub roots readily extend into the underlying natural surface layer.

Droughtiness is the main limitation to the growing of plants. An erosion hazard also exists when the soil is bare of vegetation during construction periods. Bare areas produce large amounts of runoff and sediment. This complex has few limitations for most nonfarm uses. In excavated areas, however, stability of trench walls is poor. Not assigned to a capability unit or a woodland suitability group.

Condit Series

The Condit series consists of nearly level, poorly drained soils. These soils formed in silty clay loam or clay loam glacial till. They are in shallow depressions and natural drainageways in the western part of the county. Typically, they are in the lowest parts of uplands and receive runoff from the adjacent Bennington and Mahoning soils.

In a representative profile in a pasture, the surface layer is silt loam 8 inches thick. It is dark gray in the upper 3 inches and mottled grayish brown below. The subsoil, between depths of 8 to 37 inches, is mottled gray, firm silty clay loam. The lower part of the subsoil, to a depth of 48 inches, is mottled brown, very firm clay loam. The underlying material, to a depth of 60 inches, is mottled, brown, very firm silty clay loam glacial till.

Condit soils have slow permeability in the lower part of the subsoil. They have a perched water table. These soils have a moderately deep rooting zone when the seasonal water table is low. They dry out slowly in spring unless they are artificially drained. The available water capacity is moderate.

Most areas of these soils have not been artificially drained sufficiently to support cultivated crops. These soils are commonly used for pasture, woodland, and wetland wildlife habitat. Cultivated areas are generally managed and farmed with the adjacent soils. The potential productivity is low to moderate.

Representative profile of Condit silt loam in a pasture in Harrisville Township, about 800 feet south of Esselburn Pawnee Road and Pawnee Eastern Road junction, about 600 feet east of Esselburn Pawnee Road:

A1—0 to 3 inches, dark-gray (10YR 4/1) silt loam; moderate, fine, granular structure; friable; many roots; about 1 percent coarse fragments; neutral; abrupt, smooth boundary.

A2g—3 to 8 inches, grayish-brown (2.5Y 5/2) silt loam; common, medium, distinct, yellowish-brown (10YR 5/4) mottles and common, fine, prominent, brown (7.5YR 5/4) mottles; weak, fine, subangular blocky structure; friable; many roots; about 1 percent coarse fragments; medium acid; clear, smooth boundary.

B21tg—8 to 18 inches, gray (10YR 6/1) silty clay loam; common, fine, prominent, strong-brown (7.5YR 5/6) mottles; weak, medium, subangular blocky structure; firm; common roots; thin, continuous, light-gray (10YR 7/1) silty degraded ped surfaces; thin, very patchy, dark-gray (10YR 4/1) clay films; about 1 percent coarse fragments; strongly acid; clear, wavy boundary.

B22tg—18 to 23 inches, gray (10YR 5/1) silty clay loam; many, medium, prominent, strong-brown (7.5YR 5/6) mottles; moderate, coarse, prismatic structure parting to moderate, medium, subangular blocky; firm; few roots; thin, patchy, light brownish-gray (10YR 6/2) clay films on ped surfaces; about 1 percent coarse fragments; strongly acid; clear, wavy boundary.

B23tg—23 to 37 inches, gray (10YR 5/1) silty clay loam; many, medium, distinct, yellowish-brown (10YR 5/6) mottles and common, fine, prominent, brown (7.5YR 5/4) mottles; moderate, coarse, prismatic structure parting to moderate, coarse, subangular blocky; firm; medium, patchy, gray (10YR 5/1) clay films on ped surfaces; 5 percent coarse fragments; common, medium, dark stains; medium acid; clear, wavy boundary.

B3t—37 to 48 inches, brown (10YR 5/3) light clay loam; many, coarse, distinct, dark yellowish-brown (10YR 4/4) mottles and gray (N 5/0) seams; weak, coarse, prismatic structure; very firm; moderate, patchy clay films on ped surfaces; 5 percent coarse fragments; common, medium, dark stains; slightly acid; clear, wavy boundary.

C—48 to 60 inches, brown (10YR 5/3) silty clay loam; common, medium, distinct yellowish-brown (10YR 5/4) mottles, gray (N 5/0) seams, and light gray (N 7/0) calcareous coatings; massive; very firm; 5 percent coarse fragments; mildly alkaline; strong effervescence.

The solum ranges from 30 to 55 inches in thickness. In undisturbed areas the A1 horizon ranges from black (10YR 2/1) to dark gray (10YR 4/1) in hues of 10YR to 5Y. It is 1 to 4 inches thick. The A2 horizon has hue of 10YR, 2.5Y, or N; value of 4 to 6; and chroma of 0 to 3. Thickness of the A2 horizon ranges from 2 to 8 inches. In cultivated areas the Ap horizon ranges from dark gray (10YR 4/1) to grayish brown (2.5Y 5/2). The B2 horizon ranges from dark gray (10YR 4/1) to gray (5Y 6/1). It is mostly silty clay loam that is neutral to strongly acid. Content of coarse fragments is less than 8 percent. The C horizon has hue of 10YR or 2.5Y, value of 4 to 5, and chroma of 2 to 4. It is silty clay loam or clay loam that is mainly mildly alkaline but ranges to moderately alkaline. Content of coarse fragments is less than 15 percent.

The Condit soils are the poorly drained member of a drainage sequence that includes the somewhat poorly drained Bennington and Mahoning soils, the moderately well drained Cardington and Ellsworth soils, and the very poorly drained Miner soils. The Condit soils are grayer throughout than all of these soils except for the Miner soils. They have a lighter colored A horizon than the Miner soils. The Condit soils are less clayey than the nearly Canadice soils.

Cy—Condit silt loam. This nearly level soil is along drainageways or in small depressions. Areas along drainageways are long and narrow. Most areas of this soil are adjacent to the somewhat poorly drained Bennington and Mahoning soils.

Included with this soil in mapping are small areas of soils that have a darker colored, more clayey surface layer and areas of soils that have thicker loamy layers than those in the profile described as representative of the series. In some areas bedrock is below a depth of 5 feet.

Wetness is the major limitation to the use of this soil for farming. Runoff is slow, and ponding is common. Tile drainage is generally difficult to install because of the lack of natural drainage outlets. Wetness, a perched seasonal high water table, and slow permeability are limitations to many nonfarm uses. Capability unit IIIw-2; woodland suitability group 2w2.

Ellsworth Series

The Ellsworth series consists of gently sloping to very steep, moderately well drained soils that are mainly moderately fine textured in the subsoil. These soils formed in glacial till. They are on uplands in the northern and western parts of the county. Ellsworth soils are the dominant soils on the Defiance Moraine.

In a representative profile in a cultivated area, the plow layer is dark grayish-brown silt loam 8 inches thick. The subsoil is 25 inches thick. The upper 11 inches is yellowish-brown, firm silty clay loam that is mottled below a depth of 13 inches. The lower 14 inches is mottled dark yellowish-brown, firm silty clay and silty clay loam. The underlying material, between depths of 33 and 60 inches, is dark-brown silty clay loam glacial till.

These soils have slow to very slow permeability in the subsoil and in the underlying glacial till. The available water capacity is low to moderate. These soils mostly have a moderately deep rooting zone. They are saturated with free water for periods in winter and spring. Consequently, they are slow to dry out in spring. The temporary water table is perched and commonly represents a low quantity of water. Ellsworth soils have a narrow range of moisture content at which they are suited to cultivation. If the soils are cultivated when they are too wet, they become cloddy and hard when dry. Also, vertical cracks as much as 1 inch in width form in these soils when they become dry. These cracks can extend to a depth of about 5 feet.

Most areas of these soils have been cleared and farmed. Several of the cleared areas, however, have since been allowed to revert to natural vegetation, which includes small hardwoods. The main crops are meadow, wheat, oats, and corn. Potential productivity is low to moderate.

Representative profile of Ellsworth silt loam, 2 to 6 percent slopes, moderately eroded, in a meadow in Liverpool Township, about 0.9 mile east of Grafton Road and State Route 252 junction, and about 600 feet south of Grafton Road:

Ap—0 to 8 inches, dark grayish-brown (10YR 4/3) silt loam and about 35 percent yellowish-brown (10YR 5/4) subsoil material; moderate, medium, granular structure; friable; many roots; 5 percent coarse fragments; slightly acid; abrupt, smooth boundary.

B21t—8 to 13 inches, yellowish-brown (10YR 5/4) silty clay loam; moderate, medium, angular blocky structure; firm; common roots; thin, continuous, brown (10YR 5/3) silty coatings on ped surfaces; thin, very patchy, dark yellowish-brown (10YR 4/4) clay films; 3 percent coarse fragments; very strongly acid; clear, smooth boundary.

B22t—13 to 19 inches, yellowish-brown (10YR 5/4) heavy silty clay loam; common, medium, distinct, grayish-brown (10YR 5/2) mottles; moderate, medium, angular blocky structure; firm; few roots; thin, continuous, brown (10YR 4/3) coatings on ped surfaces; thin, patchy, dark yellowish-brown (10YR 4/4) clay films; 3 percent coarse fragments; strongly acid; clear, wavy boundary.

B23t—19 to 24 inches, dark yellowish-brown (10YR 4/4) silty clay; common, fine, distinct, grayish-brown (10YR 5/2) mottles; moderate, coarse, prismatic structure parting to moderate, coarse, angular blocky; firm; few roots; thin, continuous, brown (10YR 4/3) coatings on ped surfaces; thin, patchy, dark yellowish-brown (10YR 4/4) clay films; few, medium, distinct, dark-brown (7.5YR 3/2) stains; 3 percent coarse fragments; medium acid; clear, wavy boundary.

B3t—24 to 33 inches, dark yellowish-brown (10YR 4/4) heavy silty clay loam; few, fine, distinct, grayish-brown (10YR 5/2) mottles; moderate, coarse, prismatic structure parting to weak, coarse, angular blocky; firm; thin, continuous, brown (10YR 4/3) coatings on ped surfaces; thin, patchy, dark yellowish-brown (10YR 4/4) clay films; common, medium, distinct, dark-brown (7.5YR 3/2) stains; 3 percent coarse fragments; slightly acid; clear, wavy boundary.

C—33 to 60 inches, dark-brown (10YR 4/3) silty clay loam; massive; firm; 8 percent coarse fragments; many, fine, distinct, light-gray (10YR 7/1) calcareous coatings; mildly alkaline; strong effervescence.

Thickness of the solum and depth to carbonates range from 28 to 44 inches. Reaction in the solum ranges from very strongly acid to neutral. In undisturbed areas, a very dark grayish-brown (10YR 3/2) A1 horizon, 1 to 3 inches thick, and a brown (10YR 5/3) or dark-brown to brown (10YR 4/3) A2 horizon, 3 to 7 inches thick, are present. In places there is a thin B1 horizon, 2 to 4 inches thick, that is typically silty clay loam. The B2t horizon is yellowish brown (10YR 5/4), dark brown to brown (10YR 4/3), and dark yellowish brown (10YR 4/4). Depth from the surface to gray mottles ranges from 10 to 18 inches. Coatings on the ped surfaces commonly are 1 to 3 chroma units lower than that of the matrix. The B2t horizon is silty clay loam, clay loam, silty clay, or clay. A B3 horizon is present in most profiles. This horizon has matrix and coating colors similar to those of the B2t horizon. The C horizon is silty clay loam or clay loam. The content of coarse fragments is typically less than 10 percent.

Ellsworth soils are the moderately well drained member of a drainage sequence that includes the somewhat poorly drained Mahoning soils, the poorly drained Condit soils, and the very poorly drained Miner soils. Ellsworth soils are slightly more clayey in the B horizon than Cardington soils, which lie south of Defiance Moraine in the western part of the county. Ellsworth soils also have stronger profile development and moderate to strong prismatic structure. They lack bedrock within a depth of 40 inches, which is present in the adjacent Loudonville soils. They are less clayey in the B and C horizons than the Geeburg soils. They formed in glacial till, and the Geeburg soils formed in lacustrine material.

EIB—Ellsworth silt loam, 2 to 6 percent slopes. This gently sloping soil is on fairly broad uplands. Many areas are on short knolls or on side slopes parallel to drainageways and are mostly less than 40 acres in size. A few areas are larger than 100 acres. Areas are mainly irregular in shape.

Included with this soil in mapping are spots of soils that are moderately eroded. These soils have pebbles and coarse fragments on the surface, and they have a stickier, more clayey surface layer than that of similar uneroded soils. Small areas of Mahoning soils are in depressions. A few areas of soils have bedrock just below a depth of 5 feet. These soils are mostly in Brunswick and Hinckley Townships, where some adjacent soils are shallow or moderately deep to bedrock.

Runoff is medium, but the hazard of erosion is severe when this soil is cultivated. The surface layer has a slightly higher organic-matter content, a higher available moisture capacity, and better workability than that of the moderately eroded Ellsworth soils. Seasonal wetness, a clayey subsoil, and slow permeability are limitations for many nonfarm uses. Capability unit IIIe–1; woodland suitability group 3o1.

EIB2—Ellsworth silt loam, 2 to 6 percent slopes, moderately eroded. This gently sloping soil is mainly on knolls and short side slopes parallel to drainageways. Most areas are less than 20 acres in size. A few areas are on fairly broad uplands that are as large as 75 acres. Areas range from nearly circular to irregular in shape. This soil has the profile described as representative of the series.

Included with this soil in mapping are small areas of Mahoning soils that are mainly along shallow drainageways and at the head of drainageways. Some areas of Mahoning soils are in small depressions. A few spots of this soil are underlain with bedrock at a depth of slightly more than 5 feet, particularly in Brunswick and Hinckley Townships. Also included are some small areas of severely eroded soils, commonly on knolls or near the crest of short slope breaks. These soils have a lighter colored plow layer than does this Ellsworth soil.

This soil is more difficult to till than the less eroded Ellsworth soils. Also, the organic-matter content and available water capacity of the surface layer are lower because of past erosion. Runoff is medium and the hazard of erosion is severe in cultivated fields. Slow permeability, a clayey subsoil, and seasonal wetness are limitations for many nonfarm uses. Capability unit IIIe–1; woodland suitability group 3o1.

EIC—Ellsworth silt loam, 6 to 12 percent slopes. This sloping soil is mostly in woodland. It is on knolls and side slopes parallel to drainageways. Many of the areas are 5 to 10 acres in size. This soil has a profile similar to the one described as representative of the series, but the surface layer typically has not been plowed and is darker.

Included with this soil in mapping are small areas of Mahoning soils and a few small areas of soils in which sandstone or shale is at a depth of 5 feet or less. Also included are a few spots of eroded soils. Typically, these eroded spots are in open areas adjacent to woodland.

Runoff is rapid and the hazard of erosion is very severe if cultivated crops are grown. This soil is more productive than the moderately eroded Ellsworth soils. Slope, slow permeability, a clayey subsoil, and seasonal wetness are limitations for most nonfarm uses. Capability unit IVe–1; woodland suitability group 3o1.

EIC2—Ellsworth silt loam, 6 to 12 percent slopes, moderately eroded. This sloping soil is on knolls and side slopes. It is adjacent to and, in many places, is in drainageways. Most areas of this soil have been farmed in recent years or are being farmed. Most areas are less than 20 acres in size.

Included with this soil in mapping are small areas of severely eroded soils that have a brown or yellowish-brown surface layer. These soils are mostly on the upper parts of slopes. Also included are small areas of less sloping Mahoning soils.

In cultivated areas, runoff is rapid and the hazard of erosion is very severe. The surface layer is sticky when wet and in many places it is cloddy and difficult to till. Slope, slow permeability, a clayey subsoil, and seasonal wetness are limitations for many nonfarm uses. Capability unit IVe–1; woodland suitability group 3o1.

EIE2—Ellsworth silt loam, 12 to 25 percent slopes, moderately eroded. This moderately steep to steep soil is mainly adjacent to major drainageways, and it has rather short slopes. Most areas are winding and are

narrow in shape. These areas are generally less than 30 acres in size.

Included with this soil in mapping are small areas of Berks soils. Also included are small spots of severely eroded soils in which the surface layer is yellowish brown. These soils have a soft, sticky surface layer when wet.

Areas of this soil that are wooded are generally uneroded. Runoff is rapid to very rapid. Most areas of this soil are too steep and too eroded to be suited to cultivated crops. They are, however, suited to pasture or woodland. Slope is the major limitation for most nonfarm uses. Capability unit VIe–1; woodland suitability group 3r1.

ElF—Ellsworth silt loam, 25 to 70 percent slopes. This very steep soil is on the side slopes adjacent to the major streams in the northern and western parts of the county. Some slopes are rather short. Most areas are winding and narrow and are generally less than 25 acres in size. In Hinckley Township a few areas are long, and broad in shape and more than 100 acres in size. Most of these areas are transsected by numerous drainageways.

Included with this soil in mapping are small areas of Berks soils, a few areas of soils that have sandstone boulders on the surface, a few gullies, and a few deeper soils on the colluvial base slopes. Areas along the West Branch and North Branch of Rocky River are commonly underlain by clayey lacustrine material. In some areas this material is at or near the surface.

Most areas of this soil are wooded. Cultivation is not practical because of slope. Runoff is very rapid. Downslope slippage is a concern in areas not protected by vegetation. Slope is the dominant limitation for nonfarm uses of this soil. Capability unit VIIe–2; woodland suitability group 3r2.

EsB—Ellsworth silt loam, sandstone substratum, 2 to 6 percent slopes. This gently sloping soil is in areas in the northern part of the country. It has sandstone or siltstone bedrock at a depth of 40 to 60 inches. Most areas are oblong to irregular in shape and less than 25 acres in size. This soil has a profile similar to the one described as representative of the series, but it formed in thin glacial till material over bedrock. It commonly has slightly better internal drainage, and it has a slightly thicker surface layer. Also it commonly has 5 to 10 percent sandstone fragments on the surface.

Included with this soil in mapping are a few small areas of Loudonville soils, particularly where areas of Loudonville soils are adjacent or nearby. Runoff is medium to rapid. The hazard of erosion is severe if cultivated crops are grown. Slow permeability and moderate depth to bedrock are limitations for some nonfarm uses. Capability unit IIIe–1; woodland suitability group 3o1.

EsC2—Ellsworth silt loam, sandstone substratum, 6 to 12 percent slopes, moderately eroded. This sloping soil is in areas in the northern part of the county. It formed in glacial till. It has a profile similar to the one described as representative of the Ellsworth series, but bedrock is at a depth of 40 to 60 inches. Also, it has a higher percentage of sandstone fragments on the surface. Most areas of this soil are oblong in shape and less than 20 acres in size.

Included with this soil in mapping are a few areas of soils that have slopes of 12 to 18 percent.

Runoff is rapid and the hazard of erosion is very severe if this soil is cultivated. Slope, slow permeability, a clayey subsoil, and moderate depth to bedrock are limitations for most nonfarm uses. Capability unit IVe–1; woodland suitability group 3o1.

EuB—Ellsworth-Urban land complex, undulating. This complex is in the cities of Medina and Brunswick and in the village of Spencer. It consists of gently sloping areas where much of the natural soil has been destroyed or covered as the result of grading and digging. About one-third of this complex is relatively undisturbed Ellsworth soils in undeveloped lots and parts of developed lots, and one-third is urban land. Areas of the Ellsworth soils are covered with less than 1 foot of clayey fill material. Establishing and maintaining good lawns are more difficult in these thinly covered areas. The urban land part of this complex is the land area that is covered with buildings, streets, and driveways.

The rest of the mapping unit is composed of cut and fill land. The proportion of fill land is larger than that of cut land. The fill areas have 1 foot to 3 feet of fill material overlying Ellsworth soils. The fill material is mainly from building and street excavations, and it is spread on the land adjacent to the excavation. The fill material commonly is thicker near buildings, and it becomes thinner as it is spread away from the buildings. The fill material consists of Ellsworth subsoil material and, in places, the underlying glacial till. The cut areas are characterized by exposed subsoil or substratum material typical of the Ellsworth soils. These areas are commonly adjacent to streets, where cuts were made into the landscape for the purpose of establishing grade for the street. Other areas consist of knolls that were reshaped.

The surface layer in both the cut and fill areas commonly is low in organic-matter content and has poor physical properties. It is clayey and sticky when wet, but it cracks and is hard when dry. The establishment of landscape plantings is difficult because of the properties of this soil. Topsoil applied to these areas is beneficial. Large amounts of fertilizer are needed to establish and maintain lawns.

The hazard of erosion is severe when this complex is bare of vegetation during construction periods. Runoff from these bare areas is rapid. Gullying and sedimentation are common during this period. Slow permeability, a moderate shrink-swell potential, and clayey soil material are limitations for many nonfarm uses. Not assigned to a capability unit or a woodland suitability group.

Fitchville Series

The Fitchville series consists of somewhat poorly drained, nearly level to gently sloping soils. These soils formed in stratified sediment deposited by water during glacial ponding and flooding. They are on stream terraces, glacial lakebeds, and broad valley floors throughout the county. The areas on broad valley floors are susceptible to occasional flooding.

In a representative profile in a cultivated area, the plow layer is dark grayish-brown silt loam 9 inches thick. The subsurface layer is 2 inches of mottled light

brownish-gray silt loam. The subsoil extends to a depth of 50 inches. The upper 27 inches is mottled yellowish-brown, mostly firm silty clay loam. The lower 12 inches is mottled yellowish-brown, firm loam. The underlying material, to a depth of 70 inches, is mottled dark-brown fine sandy loam.

These soils have moderately slow permeability. Available water capacity is high. These soils have a moderately deep rooting zone that is acid. A seasonal water table is near the surface in winter and spring. The water table is perched in most areas, but some areas on valley floors have an apparent water table. Fitchville soils are soft and compressible when wet. They also have a high frost-heave potential.

Most areas of Fitchville soils are farmed. Corn is commonly grown in those areas that are drained. The undrained areas are either in pasture or in grass meadow or are idle. A few areas are wooded. Potential productivity is moderate.

Representative profile of Fitchville silt loam, 0 to 2 percent slopes, in a cultivated field in Montville Township, about 3,000 feet north of Fixler Road and Bear Swamp Road junction, and about 900 feet west of Bear Swamp Road (sample MD-21 in laboratory data section):

Ap—0 to 9 inches, dark grayish-brown (10YR 4/2) silt loam; moderate, medium, granular structure in the upper part and weak, coarse, granular structure below a depth of 5 inches; friable; many roots; neutral; abrupt, smooth boundary.

A2—9 to 11 inches, light brownish-gray (2.5Y 6/2) silt loam; many, medium, faint, distinct, yellowish-brown (10YR 5/4) mottles and many, medium, light-gray (2.5Y 7/2), degraded surfaces; weak, fine and medium, subangular blocky structure; friable; common roots; medium acid; clear, irregular boundary.

B21tg—11 to 15 inches, yellowish-brown (10YR 5/4) heavy silt loam; common, medium, distinct, gray (10YR 6/1) mottles; moderate, medium, subangular blocky structure; friable; common roots; thin, continuous, grayish-brown (10YR 5/2) coatings on ped surfaces; thin, patchy, gray (10YR 6/1) clay films; few, fine, dark concretions; very strongly acid; clear, wavy boundary.

B22tg—15 to 23 inches, yellowish-brown (10YR 5/4) silty clay loam; common, medium, faint, yellowish-brown (10YR 5/6) mottles; moderate, coarse, prismatic structure parting to moderate, coarse and medium, subangular blocky; firm; few roots; distinct, medium, continuous, gray (10YR 6/1) coatings on ped surfaces; medium, very patchy, gray (10YR 6/1) clay films; few, fine, dark concretions; very strongly acid; clear, smooth boundary.

B23tg—23 to 30 inches, yellowish-brown (10YR 5/4) silty clay loam; common, medium, faint, yellowish-brown (10YR 5/6) mottles; moderate, coarse, prismatic structure parting to moderate, thick, platy; firm; few roots; medium, continuous, gray (10YR 6/1) coatings on ped surfaces; medium, very patchy, gray (10YR 6/1) clay films; few, fine, dark concretions; very strongly acid; clear, wavy boundary.

B24tg—30 to 38 inches, yellowish-brown (10YR 5/4) loam; many, medium, distinct, gray (10YR 6/1) mottles many, medium, faint, yellowish-brown (10YR 5/6) mottles; moderate, coarse, prismatic structure parting to weak, thick, platy; firm; few roots; thin, patchy, gray (10YR 5/1) clay films; common, fine, dark concretions; strongly acid; clear, wavy boundary.

B3g—38 to 50 inches, yellowish-brown (10YR 5/4) loam; many, medium, faint, yellowish-brown (10YR 5/6) mottles and many, medium, distinct, gray (10YR 5/1) mottles; weak, coarse, prismatic structure parting to weak, thick, platy; firm; thin, very patchy, gray (10YR 5/1) clay films; common, fine, dark concretions; very strongly acid; clear, wavy boundary.

IIC—50 to 70 inches, dark-brown (10YR 4/3) fine sandy loam; many, medium, distinct, grayish-brown (10YR 5/2), gray (10YR 5/1), and yellowish-brown (10YR 5/6) mottles; massive; friable; common, fine, dark concretions; medium acid.

The solum ranges from 30 to 60 inches in thickness. The Ap horizon is dominantly dark grayish brown (10YR 4/2) but includes dark brown (10YR 4/3), grayish brown (10YR 5/2), and dark grayish brown (2.5Y 4/2). The Bt horizon ranges from 18 to 40 inches in thickness. It begins at a depth of 10 to 16 inches. The B horizon has hue of 10YR, 7.5YR, or 2.5Y, value of 4 to 6, and chroma of 1 to 6, but chroma of 2 or less make up less than 60 percent of the matrix. Ped surfaces dominantly have chroma of 2 or less. The B horizon is commonly silt loam or silty clay loam, but individual horizons are loam or clay loam in some profiles. A thin, very firm layer, less than 6 inches thick, that is slightly brittle is in the lower part of the Bt horizon in some profiles. The B horizon is very strongly acid to medium acid. The C horizon is typically stratified with layers ranging from sandy loam to silty clay in texture. It is medium acid to slightly acid.

Fitchville soils are the somewhat poorly drained member of a drainage sequence that includes the moderately well drained Glenford soils, the poorly drained Sebring soils, and the very poorly drained Luray soils. They are commonly adjacent to Glenford, Sebring, Bogart, Jimtown, Oshtemo, Canadice, and Mahoning soils. Fitchville soils have less sand and gravel in the A and B horizons than Bogart, Jimtown, and Oshtemo soils. The Fitchville soils are less clayey than Canadice and Mahoning soils and contain fewer coarse fragments than Mahoning soils. Fitchville and Tiro soils are similar, but Fitchville soils are underlain by stratified sediment and Tiro soils are underlain by glacial till.

FcA—Fitchville silt loam, 0 to 2 percent slopes. This nearly level soil is in broad glacial lake basins and slightly higher lying terraces. The larger areas are south of Lodi, and they are as much as 100 acres in size. The smaller areas are on the slightly higher lying terraces, are irregular in shape, and range from 5 to about 50 acres in size. This soil has the profile described as representative of the series.

Included with this soil in mapping are a few spots or poorly drained Sebring soils along shallow drainageways and in depressions. Also included are some sandy and gravelly spots. Where this soil occurs in depressional areas on uplands, it is commonly underlain by glacial till at a depth of about 5 feet.

Ponding and seasonal wetness are the major limitations for most uses of this soil. Runoff is slow. Water drains slowly from this soil, even when artificial drainage is provided. In cultivated areas the surface layer is susceptible to crusting. Seasonal wetness, soil material that is soft and compressible when wet, high potential frost action, and moderately slow permeability are limitations for many nonfarm uses. Capability unit IIw-4; woodland suitability group 2w3.

FcB—Fitchville silt loam, 2 to 6 percent slopes. This gently sloping soil is on terraces and alluvial fans. Areas of this soil are mostly oval or irregular in shape, and they range from about 5 to 30 acres in size. These areas typically occur as rises on broad level terraces.

Included with this soil in mapping are a few spots of Glenford soils, particularly on the more sloping knolls. Also included are a few small eroded spots of soils in which the surface layer is lighter colored than

that of this Fitchville soil. There are small spots of soils that have a sandy surface layer.

Seasonal wetness is the major limitation to use of this soil for crops. Water drains slowly from this soil, even when artificial drainage is provided. Because of the slope, runoff is medium to rapid. As a result, erosion is also a hazard. In cultivated areas, the surface layer crusts easily. Seasonal wetness, soil material that is soft and compressible when wet, high potential frost action, and moderately slow permeability are limitations for many nonfarm uses. Capability unit IIw-4; woodland suitability group 2w3.

FlA—Fitchville silt loam, low terrace, 0 to 2 percent slopes. This nearly level soil is on broad, low-lying terraces that are adjacent to most of the major streams throughout the county. Typically, this soil is on slightly higher landscapes than the adjacent soils on first bottoms, but it is still susceptible to occasional flooding. The larger areas are adjacent to the stream channel. The largest area of this soil is along Killbuck Creek. It is about 700 acres in size. The areas of this soil along the other major streams are typically less than 50 acres.

Included with this soil in mapping are a few small spots of the poorly drained Sebring soils. These spots are along the shallow drainageways and in depressions. In some places, the profile is not so strongly developed as the profile described as representative of the series. Also included are areas of stratified soils that are either more clayey or are more loamy than this Fitchville soil.

Flooding and seasonal wetness are the major limitations to use of this soil for most purposes. Surface crusting can be severe in cultivated areas. High potential frost action and moderately slow permeability restrict the use of this soil for most nonfarm uses. Capability unit IIw-1; woodland suitability group 2w3.

Geeburg Series

The Geeburg series consists of sloping to moderately steep, moderately well drained soils. These soils formed in lacustrine sediment. They are on toe slopes along the East Branch of Rocky River in the northeastern corner of the county and along the East Branch of Black River in Spencer and Chatham Townships.

In a representative profile the plow layer is 8 inches of dark grayish-brown silt loam. The subsoil extends to a depth of 28 inches. The upper 5 inches is yellowish-brown, firm silty clay loam. The lower 15 inches is mottled dark yellowish-brown, very firm silty clay. The underlying material, between depths of 28 and 60 inches, is mottled, dark-brown, very firm silty clay.

The Geeburg soils have very slow permeability in the subsoil and the underlying material. The available water capacity is low. These soils have a moderately deep rooting zone. Cracks as wide as 2 inches form in these soils when they become dry. These cracks can extend to a depth of about 5 feet. These soils have a perched water table for short periods in spring.

These soils are used about equally for pasture and woodland. The potential productivity is moderate.

Representative profile of Geeburg silt loam, 6 to 18 percent slopes, in a pasture in Hinckley Township, about 4,300 feet east of Ridge Road and State Route 303 junction and about 2,000 feet west of the Medina-Summit County line:

Ap—0 to 8 inches, dark grayish-brown (10YR 4/2) heavy silt loam; moderate, medium, granular structure; friable; many roots; medium acid; abrupt, smooth boundary.

B1—8 to 13 inches, yellowish-brown (10YR 5/4) silty clay loam; moderate, medium, angular blocky structure; firm; common roots; thin, continuous, brown (10YR 5/3) coatings on ped surfaces; strongly acid; clear, wavy boundary.

B2t—13 to 28 inches, dark yellowish-brown (10YR 4/4) silty clay; common, fine, distinct, light brownish-gray (10YR 6/2) mottles; moderate, medium, prismatic structure parting to moderate, medium, angular blocky; very firm; sticky and plastic when wet; few roots; thin, continuous, grayish-brown (10YR 5/2) clay films on prism faces and patchy brown (10YR 4/3) clay films on horizontal ped surfaces; medium acid grading to neutral at a depth of 24 inches; clear, wavy boundary.

C1—28 to 40 inches, dark-brown (10YR 4/3) silty clay; many, medium, distinct, gray (10YR 6/1) mottles and common, fine, distinct, yellowish-brown (10YR 5/4) mottles; massive; very firm; sticky and plastic when wet; common, medium, light-gray (10YR 7/1) calcareous coatings; mildly alkaline; slight effervescence; gradual boundary.

C2—40 to 60 inches, dark-brown (10YR 4/3) silty clay; many, medium, distinct, gray (10YR 5/1) mottles and common, fine, distinct, yellowish-brown (10YR 5/4) mottles; massive; very firm; sticky and plastic when wet; common, medium, light-gray (10YR 7/1) calcareous coatings; mildly alkaline; strong effervescence.

The solum ranges from 22 to 38 inches in thickness. Content of coarse fragments is less than 2 percent, by volume. The Ap horizon is typically dark grayish brown (10YR 4/2) but includes dark brown to brown (10YR 4/3) and brown (10YR 5/3). In undisturbed areas the A1 horizon is 1 to 4 inches thick and is very dark grayish brown (10YR 3/2) or black (10YR 2/1); the A2 horizon is 2 to 8 inches thick.

The B2t horizon is clay or silty clay. It has hue of 10YR and 2.5Y, value of 4 or 5, and chroma of 3 to 5. Mottles that have chroma of 2 or less are lacking in the B1 horizon, but they are common throughout the B2t horizon. Reaction in the B horizon is generally strongly acid in the upper part, but it grades to neutral in the lower part. The C horizon is mildly alkaline, commonly contains some gypsum crystals, and is silty clay or clay.

Geeburg soils are the moderately well drained member of the drainage sequence that includes the somewhat poorly drained Caneadea soils and the very poorly drained Canadice soils. They are commonly adjacent to Ellsworth, Loudonville, Rawson, and Haskins soils. They are similar to Ellsworth and Cardington soils. Geeburg soils have more clayey B and C horizons than Ellsworth and Loudonville soils. They are not loamy in the upper part of the B horizon as are the Rawson and Haskins soils. They are more clayey than Cardington soils. Geeburg soils formed in lacustrine material, but the Cardington and Ellsworth soils formed in glacial till.

GbC—Geeburg silt loam, 6 to 18 percent slopes. This sloping to moderately steep soil is mainly in areas in the northeast corner of the county, near the headwaters of the East Branch of Rock River. In this area it is on toe slopes that are dissected by numerous waterways. The waterways commonly are slightly entrenched or moderately entrenched into the landscape. The crowned areas between the waterways are mainly sloping, and the side slopes along the waterways are moderately steep. Most areas are less than 25 acres

in size and are irregular in shape. This soil is also in small areas along the East Branch of Black River. In these areas the soil has short slopes and is parallel to the streams and drainageways for relatively long distances. In these places it has a thinner, lighter colored surface layer.

Included with this soil in mapping are small areas of Ellsworth and Rawson soils. Also included are small spots of severely eroded soils in which the surface layer is yellowish brown and is sticky when wet.

This soil is better suited to hay or pasture than to cultivated crops. Runoff is rapid. A severe hazard of erosion is the major limitation to use for farming. Slope, very slow permeability, and high shrink-swell potential are limitations for many nonfarm uses. Capability unit VIe–1; woodland suitability group 2c1.

Glenford Series

The Glenford series consists of nearly level to sloping, moderately well drained soils. These soils formed in stratified glacial lake sediment. They are on stream terraces and lakebeds on uplands. These areas are small remnants of former glacial lakebeds that have been eroded and dissected by drainageways.

In a representative profile in a cultivated area, the plow layer is dark grayish-brown silt loam 9 inches thick. The subsoil extends to a depth of 46 inches. It is dark yellowish-brown, mostly firm silt loam and silty clay loam. Light brownish-gray, gray, and yellowish-brown mottles are below a depth of 19 inches. The underlying material, between depths of 46 and 60 inches, is mottled brown sandy loam.

The Glenford soils have moderately slow permeability in the lower part of the subsoil. The available water capacity is high. These soils have a deep rooting zone that is strongly acid to very strongly acid except where limed. They have a high water table that is mainly perched during the seasonal wet periods. When saturated, the soil material is soft and compressible, and the potential frost action is high. These soils are unstable in sloping areas.

Many areas of Glenford soils are small and are farmed with the adjacent soils. Some of the areas formerly cleared for farming are reverting to brush and trees. They have moderate to high potential productivity.

Representative profile of Glenford silt loam, 2 to 6 percent slopes, in a meadow in Liverpool Township, about 1,600 feet south of State Route 252 and Grafton Road junction and 650 feet west of State Route 252:

Ap—0 to 9 inches, dark grayish-brown (10YR 4/2) silt loam; moderate, medium, granular structure; friable; many roots; slightly acid; abrupt, smooth boundary.

B1—9 to 13 inches, dark yellowish-brown (10YR 4/4) silt loam; weak, fine, subangular blocky structure; friable; common roots; thin, continuous, brown (10YR 5/3) silt coatings on ped surfaces; strongly acid; clear, smooth boundary.

B21t—13 to 19 inches, dark yellowish-brown (10YR 4/4) heavy silt loam; moderate, medium, subangular blocky structure; firm; common roots; thin, continuous, brown (10YR 5/3) silt coatings on ped surfaces and in voids; strongly acid; clear, wavy boundary.

B22t—19 to 28 inches, dark yellowish-brown (10YR 4/4) heavy silt loam; common, fine, distinct, light brownish-gray (10YR 6/2) and yellowish-brown (10YR 5/6) mottles; moderate, coarse, subangular blocky structure; firm; few roots; thin, continuous, brown (10YR 5/3) silt coatings on ped surfaces; thin, very patchy, dark yellowish-brown (10YR 4/4) clay films on ped surfaces and in voids; strongly acid; clear, wavy boundary.

B23t—28 to 38 inches, dark yellowish-brown (10YR 4/4) silty clay loam; common, fine, distinct, light brownish-gray (10YR 6/2) and yellowish-brown (10YR 5/6) mottles; weak, coarse, prismatic structure parting to weak, thick, platy; firm; few roots; thin, patchy, dark yellowish-brown (10YR 4/4) clay films on ped surfaces and in pores; strongly acid; clear, wavy boundary.

B3t—38 to 46 inches, dark yellowish-brown (10YR 4/4) silty clay loam; common, medium, distinct, gray (10YR 6/1) mottles and common, fine, distinct, yellowish-brown (10YR 5/6) mottles; weak, coarse, subangular blocky structure; firm; few roots; thin, patchy, dark yellowish-brown (10YR 4/4) clay films on ped surfaces and in pores; strongly acid; clear, wavy boundary.

C—46 to 60 inches, brown (10YR 5/3) sandy loam; many, medium, distinct, gray (10YR 6/1) mottles and common, medium, distinct, yellowish-brown (10YR 5/6) mottles; massive; friable; few, fine, distinct, black (10YR 2/1) concretions; medium acid.

The solum ranges from 30 to 60 inches in thickness. The content of coarse fragments is less than 5 percent throughout the solum. In cultivated areas the Ap horizon is dark grayish brown (10YR 4/2) or dark brown (10YR 4/3). In undisturbed areas the A1 horizon is very dark grayish brown (10YR 3/2) or very dark brown (10YR 2/2), and it is 1 inch to 4 inches thick, the A2 horizon is typically brown (10YR 5/3) and is 2 to 8 inches thick. The B1 horizon is 2 to 5 inches thick. It commonly has brown (10YR 5/3) or pale-brown (10YR 6/3) silt coatings on ped surfaces. In some profiles the B1 horizon is replaced by a B&A horizon or A&B horizon. The Bt horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 to 5. The Bt horizon is silt loam and silty clay loam but in places has thin layers of loam, sandy loam, or clay loam. It is very strongly acid to slightly acid. The C horizon is stratified layers that range from sandy loam to silty clay loam.

Glenford soils are in the same topographic and drainage sequence as the lower lying, somewhat poorly drained Fitchville soils, the poorly drained Sebring soils, and the very poorly drained Luray soils. The Glenford soils are similar in texture but are browner and less mottled than Fitchville, Sebring, and Luray soils. They also have a lighter colored A horizon than Luray soils. Glenford soils are adjacent to Bogart soils but contain less sand and more silt.

GfA—Glenford silt loam, 0 to 2 percent slopes. This nearly level soil is on terraces. Most areas are less than 10 acres in size and are oval to circular in shape. This soil is typically underlain by strata of sand and gravel, and it is generally adjacent to the well-drained Chili soils.

Included with this soil in mapping are small spots of Chili silt loam. Also included are depressional areas of somewhat poorly drained Fitchville soils in small pockets where runoff tends to accumulate.

This soil has few limitations for most uses. Runoff is slow. The surface layer is susceptible to crusting. A high potential frost action and moderately slow permeability are limitations for some nonfarm uses. Capability unit I–1; woodland suitability group 1o1.

GfB—Glenford silt loam, 2 to 6 percent slopes. This gently sloping soil is on terraces throughout the county. Most areas are oval to circular in shape and are generally less than 15 acres in size. This soil has the profile described as representative of the series.

Included with this soil in mapping are small areas

of the somewhat poorly drained Fitchville soils. Also included are areas of soils that have thicker, more loamy subsoil and substratum than this Glenford soil. One of the major areas of these more loamy soils is along the upper reaches of Wolf Creek, just east of Sharon Center. In this area the underlying sand and gravel strata average more than 3 feet in thickness.

A moderate hazard of erosion and the susceptibility to surface crusting are limitations to use of this soil for cultivated crops. Moderately slow permeability and gentle slopes are limitations for some nonfarm uses. Capability unit IIe-2; woodland suitability group 1o1.

GfC2—Glenford silt loam, 6 to 12 percent slopes, moderately eroded. This sloping soil is on side slopes along drainageways. Most areas are elongated and are 5 to 10 acres in size. These areas are mainly between areas of Glenford silt loam, 2 to 6 percent slopes, and lower lying soils, such as Fitchville or Sebring soils. Other areas of this soil are on knolls that are more nearly circular in shape and 3 to 10 acres in size. This soil is moderately eroded, and most areas have lost as much as 50 percent of the original surface layer through erosion. The present plow layer is a mixture of the original surface layer and dark-brown or yellowish-brown subsoil material. Erosion has lowered the natural fertility, available water capacity, and organic-matter content in this soil. Also, the surface layer crusts more easily.

Included with this soil in mapping are a few areas that are underlain by glacial till at a depth of more than 40 inches. These are mostly on knolls. Also included are some small uneroded spots, small areas of Fitchville soils, a few areas of soils that are underlain by layers of sand and gravel, and a few areas of soils that are moderately steep.

Runoff is rapid, especially where the surface is not protected by plant cover. Slope, moderately slow permeability, unstable soil material, and high potential frost action are limitations for many nonfarm uses. Capability unit IIIe-2; woodland suitability group 1o1.

Haskins Series

The Haskins series consists of somewhat poorly drained, nearly level to gently sloping soils. These soils formed in 24 to 40 inches of loamy material and in the underlying finer textured glacial till or lacustrine material. They are on broad terraces along the East Branch of Black River and along the West Branch of Rocky River.

In a representative profile in a cultivated area, the plow layer is a dark grayish-brown loam 9 inches thick. The subsoil extends to a depth of 34 inches. The upper 20 inches is friable clay loam and mottled sandy clay loam. The lower 5 inches is mottled dark-brown firm silty clay loam. The underlying material, between depths of 34 and 60 inches, is mottled olive-gray silty clay lacustrine material.

Haskins soils have moderate permeability in the surface layer and in the upper part of the subsoil and slow to very slow permeability in the lower part of the subsoil and in the underlying material. The available water capacity is moderate. These soils have a moderately deep rooting zone that is acid in the upper part unless limed. A perched water table is near the surface late in winter and in spring.

Haskins soils are mostly used for crops. They have a moderate potential productivity.

Representative profile of Haskins loam, 0 to 2 percent slopes, in a cultivated field near the eastern edge of Spencer Township, about 1,000 feet east of State Route 162 and River Corners intersection and about 500 feet north of State Route 162:

Ap—0 to 9 inches, dark grayish-brown (10YR 4/2) loam; moderate, fine and medium, granular structure; friable; 2 percent pebbles; slightly acid; abrupt, smooth boundary.

B21t—9 to 14 inches, grayish-brown (10YR 5/2) clay loam; many, fine, distinct, yellowish-brown (10YR 5/6) mottles; weak, fine and medium, subangular blocky structure; friable; thin, very patchy clay bridging on sand grains; 5 percent pebbles; medium acid; clear, smooth boundary.

B22t—14 to 29 inches, grayish-brown (10YR 5/2) sandy clay loam; many, fine, distinct, yellowish-brown (10YR 5/6) mottles; weak, coarse, subangular blocky structure; friable; thin, patchy clay bridging on sand grains; 12 percent pebbles; common, fine, distinct, black (10YR 2/1) concretions; strongly acid; clear, smooth boundary.

IIB3t—29 to 34 inches, dark-brown (10YR 4/3) heavy silty clay loam; many, medium, distinct, grayish-brown (10YR 5/2) mottles and common, fine, distinct, yellowish-brown (10YR 5/6) mottles; weak, coarse, subangular blocky structure; firm; thin, continuous, gray (5Y 5/1) clay films on ped surfaces; 5 percent pebbles; common, fine, distinct, black (10YR 2/1) concretions; medium acid; abrupt, wavy boundary.

IIC—34 to 60 inches, olive-gray (5Y 5/2) silty clay; many, medium, prominent, yellowish-brown (10YR 5/6 to 5/8) mottles and many, medium, distinct, gray (5Y 6/1) mottles; massive gray (5Y 6/1) streaks; 1 percent pebbles; common, fine, prominent, black (10YR 2/1) concretions; common, fine, distinct, light-gray (10YR 7/1) calcareous coatings; mildly alkaline; strong effervescence.

The solum ranges from about 24 to 40 inches in thickness and typically extends into the underlying fine-textured material. The Ap horizon is dark grayish brown (10YR 4/2) or dark gray (10YR 4/1). The B horizon is predominantly clay loam and sandy clay loam, but it includes thin layers of sandy loam and loam. In some areas this part of the soil contains gravelly layers, but, the gravel content is typically less than 20 percent. The B horizon has hue of 10YR to 2.5Y, value of 4 or 5, and chroma of 2 to 4. Reaction is typically strongly acid in the upper part of the B horizon, unless influenced by liming. The IIB horizon and the underlying IIC horizon range from heavy silty clay loam to clay. The IIC horizon is clay in most places. The IIB horizon has matrix colors of dark brown (10YR 4/3) or brown (10YR 5/3), and the reaction is strongly acid to mildly alkaline. The IIB and IIC horizons are 0 to 10 percent.

The Haskins soils are mainly near the somewhat poorly drained Jimtown and Canadea soils and the moderately well drained Geeburg soils. They have a clayey C horizon that is not present in Jimtown soils. Haskins soils are coarser textured in the A horizon and the upper part of the B horizon than the Canadea and Geeburg soils. In places Haskins soils are adjacent to the moderately well drained Rawson soils and the well-drained, more sandy Oshtemo soils.

HsA—Haskins loam, 0 to 2 percent slopes. This nearly level soil typically is in oblong areas on outwash terraces. Areas of this soil are mostly less than 25 acres in size. This soil has the profile described as representative of the series.

Included with this soil in mapping are spots in

which the loamy upper part of the profile is either more than 40 inches or less than 24 inches thick over the underlying finer textured material. Also included are small areas of soils that have a surface layer of silt loam or sandy loam.

This soil has a moderate hazard of wetness. The water table fluctuates near the surface in winter and spring. Consequently, this soil warms up rather slowly in spring. Runoff is slow. Wet soil conditions and slow permeability in the underlying clayey subsoil and substratum are limitations for many nonfarm uses. Capability unit IIw-3; woodland suitability group 2w3.

HsB—Haskins loam, 2 to 6 percent slopes. This gently sloping soil is in rounded to oblong areas on outwash terraces. These areas are generally less than 25 acres in size and are mainly along the East Branch of Black River.

Included with this soil in mapping are small areas of soils that are better drained than this Haskins soil. Typically, these better drained soils are on the higher lying knolls or adjacent to the slope break that separates the terrace level from the lower lying stream valley. Also included are small areas of soil in which the loamy upper part of the profile is less than 24 inches thick or more than 40 inches.

This soil has a moderate limitation because of wetness. The water table is near the surface in winter and spring. Because of better surface drainage, this soil warms up earlier in spring than the nearly level Haskins soil. Runoff is slow to moderate, and the hazard of erosion is slight. Wetness and slow permeability in the clayey lower part of the subsoil and in the substratum are limitations for many nonfarm uses. Capability unit IIw-3; woodland suitability group 2w3.

Holly Series

The Holly series consists of nearly level, poorly drained soils. These soils are in old oxbows, seep spots, and low-lying areas of flood plains. They formed in recent alluvium. Ponding is common throughout much of the year, and the gradient of the nearby stream is generally low.

In a representative profile the surface layer is a dark-gray silt loam 9 inches thick. The subsoil, between depths of 9 and 28 inches, is gray, firm to friable silt loam and loam. The underlying material, to a depth of 60 inches or more, is olive-gray and dark-gray sandy loam.

Holly soils have moderate to moderately slow permeability. The available water capacity is high. An apparent water table is high in winter, in spring, and early in summer, and the soils are susceptible to flooding. These soils have a moderately deep or deep rooting zone when the water table is low late in summer or if the soil is drained. In some places the level of the water table is controlled by the level of the nearby stream. In other places the water table is fed by seep water from the adjacent uplands. The rooting zone is slightly acid to neutral.

Most areas of Holly soils have been cleared of trees but are not adequately drained for cultivated crops. Swamp grasses cover most areas. Some areas are used for late summer pasture. Their potential productivity is moderate if they are adequately drained.

Representative profile of Holly silt loam, in Sharon Township, about 2 miles east of Sharon Center, about 3,000 feet west of the intersection of Medina Line Road and State Route 162, about 1,800 feet south of State Route 162:

Ap—0 to 9 inches, dark-gray (5Y 4/1) silt loam; moderate, fine, granular structure; friable; slightly acid; clear, wavy boundary.

B21g—9 to 17 inches, gray (5Y 5/1) silt loam; common, medium, prominent, yellowish-brown (10YR 5/8) mottles; moderate, coarse and medium, prismatic structure; firm; gray (5Y 5/1) coatings on ped surfaces; neutral; clear, smooth boundary.

B22g—17 to 28 inches, gray (5Y 5/1) loam; many, medium, prominent, yellowish-brown (10YR 5/8 and 5/4) mottles; weak, coarse, subangular blocky structure; friable; neutral; clear, smooth boundary.

C1g—28 to 36 inches, olive-gray (5Y 5/2) sandy loam; many, medium and coarse, prominent, yellowish-brown (10YR 5/8) mottles; massive; very friable; neutral; clear, smooth boundary.

C2g—36 to 60 inches, dark-gray (N 4/0) sandy loam; common, fine, distinct, brown (7.5YR 4/2) mottles in the lower part; massive; very friable; mildly alkaline; slight effervescence.

The Ap or A1 horizon has hue of 10YR, 2.5Y, or 5Y, value of 3 or 4, and chroma of 1 or 2. The Bg horizon ranges from 15 to 30 inches in thickness. It has hue of 10YR, 2.5Y, and 5Y or N, value of 4 to 6, and chroma of 0 to 2. It is mainly silt loam or loam, but there are thin layers of sandy loam and silty clay loam. Stratification is common throughout the solum and in the C horizon.

Holly soils are the poorly drained members of a drainage sequence that includes the well drained Chagrin soils, the moderately well drained Lobdell soils, and the somewhat poorly drained Orrville soils. They are most commonly adjacent to Orrville soils and less commonly adjacent to Lobdell and Chagrin soils. Holly soils have grayer colors than these soils.

Hy—Holly silt loam. This nearly level soil is on narrow flood plains, which commonly are old abandoned stream channels or depressional areas. Most areas are narrow and oblong in shape and are less than 20 acres in size. The largest area of this soil lies along Wolf Creek, east of Sharon Center. This area is more than 300 acres.

Included with this soil in mapping are small areas of the somewhat poorly drained Orrville soils. Also included are a few spots of soils that have a thin organic surface layer. In places bedrock or silty clay loam glacial till underlies this soil at a depth of 4 feet or more.

Wetness severely limits this soil for farming. It is susceptible to flooding and ponding. Flooding, wetness, and low strength are limitations for most nonfarm uses. Capability unit IIIw-2; woodland suitability group 2w1.

Jimtown Series

The Jimtown series consists of nearly level to gently sloping, somewhat poorly drained soils. These soils formed in loamy glacial outwash material. They are on terraces along streams. These terraces generally are above the normal level of flooding. The most extensive area of Jimtown soils is south of Seville.

In a representative profile in a cultivated area, the plow layer is dark grayish-brown loam 9 inches thick. The subsoil, between depths of 9 and 44 inches, is mostly light brownish-gray and grayish-brown sandy loam, sandy clay loam, and gravelly sandy clay loam that has

yellowish-brown mottles. It is firm below a depth of 14 inches. The underlying material, between depths of 44 and 60 inches, is dark-gray gravelly sandy clay loam.

Jimtown soils have moderate to moderately rapid permeability. The available water capacity is moderate. These soils have a moderately deep to deep rooting zone when the water table is low. Where these soils are not artificially drained, the water table is near the surface late in winter and in spring. The water table is apparent and commonly represents a large quantity of water.

Jimtown soils are used mainly for farming and as a limited source of sand and gravel. If these soils are tile drained, they are moderately productive for most locally grown farm crops.

Representative profile of Jimtown loam, 0 to 2 percent slopes, in a meadow in Westfield Township, 1,000 feet west of Stuckey Road and State Route 3 junction and about 250 feet north of Stuckey Road:

Ap—0 to 9 inches, dark grayish-brown (10YR 4/2) loam; moderate, fine and medium, granular structure; friable; many roots; 5 percent gravel; slightly acid; abrupt, smooth boundary.

B1—9 to 14 inches, pale-brown (10YR 6/3) sandy loam; common, fine, faint, light brownish-gray (10YR 6/2) mottles and common, fine, distinct, yellowish-brown (10YR 5/6) mottles; weak, fine and medium, subangular blocky structure; friable; common roots; common worm casts; 5 percent gravel; medium acid; clear, wavy boundary.

B21tg—14 to 23 inches, light brownish-gray (10YR 6/2) light sandy clay loam; many, medium, distinct, yellowish-brown (10YR 5/6) mottles; moderate, medium, subangular blocky structure; firm; few roots; thin, patchy, gray (10YR 6/1) coatings on ped surfaces, part of which is clay films; thin, patchy clay bridging of sand grains; few worm casts; 8 percent gravel; few dark concretions; strongly acid; clear, wavy boundary.

B22tg—23 to 29 inches, light brownish-gray (10YR 6/2) sandy loam; many, medium, distinct, yellowish-brown (10YR 5/6) mottles; weak, medium, subangular blocky structure; firm; few roots; thin, patchy, gray (10YR 6/1) clay films on ped surfaces and bridging of sand grains; 2 percent gravel; few dark concretions; strongly acid; clear, wavy boundary.

B3tg—29 to 44 inches, grayish-brown (10YR 5/2) gravelly light sandy clay loam; common, fine, distinct, yellowish-brown (10YR 5/6) mottles and common, medium, faint, gray (10YR 5/1) mottles; weak, coarse, subangular blocky structure; firm; few roots; thin, patchy, grayish-brown (10YR 5/2) clay bridging between sand grains; 20 percent gravel; few dark concretions; strongly acid; clear, wavy boundary.

C—44 to 60 inches, dark-gray (10YR 4/1) gravelly light sandy clay loam; common, fine, distinct, gray (10YR 6/1) and dark yellowish-brown (10YR 4/4) mottles; massive; friable; 35 percent gravel; few dark concretions; medium acid.

Thickness of the solum ranges from 25 to 48 inches. The Ap horizon is commonly dark grayish brown (10YR 4/2 or 2.5Y 4/2). Where present the A1 horizon ranges from 3 to 5 inches in thickness and is very dark gray (10YR 3/1) or very dark grayish brown (10YR 3/2). Where present the A2 horizon ranges from 3 to 8 inches in thickness and is typically grayish brown (10YR 5/2). The B horizon has value of 4 to 6 and chroma of 2 to 4; chroma of 2 is dominant in either the matrix or on the ped surfaces. Mottles that have chroma of 4 to 6 are in this horizon. The B horizon is loam, sandy clay loam, clay loam and gravelly phases of these and thin subhorizons of sandy loam. Reaction in the B2 horizon ranges from very strongly acid to medium acid. Depth to the neutral or alkaline part of the profile ranges from 36 inches to more than 60 inches.

Jimtown soils most commonly are adjacent to moderately well drained Bogart soils and well-drained Chili soils. They generally receive more runoff or seepage water from the adjacent higher soil areas than either the Bogart or Chili soils. Jimtown soils, in a few places, are adjacent to very swampy pockets on the landscape. They lack the thick dark A horizon common to both the Lorain and Olmsted soils. They have a higher sand and gravel content in the solum than the nearby Fitchville soils. They lack the finer textures common in the nearby Mahoning soils and in the lower part of the B horizon of the nearby Haskins soils.

JtA—Jimtown loam, 0 to 2 percent slopes. This nearly level soil is in irregularly shaped areas on outwash terraces and kames on uplands. South of Seville this soil is on broad stream terraces. These areas are commonly less than 50 acres in size. The upland areas are mainly less than 15 acres. This soil has the profile described as representative of the series.

Included with this soil in mapping are small, depressional areas of soils that have water on or near the surface during most of the year. These soils are more severely limited by wetness than this Jimtown soil. In some places the plow layer is silt loam or sandy loam, or it is gravelly. Also included are common areas of soils on slight rises.

Wetness is a moderate limitation to farming. Runoff is slow, and there is little or no hazard of erosion. The seasonal high water table is also a limitation for many nonfarm uses. Capability unit IIw-4; woodland suitability group 2w3.

JtB—Jimtown loam, 2 to 6 percent slopes. This gently sloping soil is on outwash terraces and kames. Most areas of this soil are irregular in shape and are generally less than 15 acres in size.

Included with this soil in mapping are small areas of Bogart and Chili soils on the slightly higher knolls. Also included are small areas where the plow layer is silt loam or sandy loam, or it is gravelly phases of these textures. In places the plow layer has been eroded and is a mixture of the original surface layer and subsoil.

Wetness and hazard of erosion are moderate limitations for farming. Runoff is slow to moderate. Wetness is the major limitation for most nonfarm uses. Capability unit IIw-4; woodland suitability group 2w3.

Ju—Jimtown-Urban land complex. This complex is in the villages of Lodi and Seville. It is nearly level, and much of the natural soil has been destroyed or covered as the result of grading and digging. It is made up of areas of relatively undisturbed Jimtown soils, areas that are covered by buildings, streets, and driveways, and areas of fill land.

Included with this complex in mapping are areas of Fitchville soils that have a more silty subsoil than the Jimtown soils. These Fitchville soils are mainly in the western part of a large area in the village of Lodi, and they are west of Chippewa Creek in an area in the village of Seville. Also included in mapping are areas where the natural soils are covered with less than 1 foot of fill material.

About one-third of the total land area of this complex is relatively undisturbed Jimtown soils or the included Fitchville soils. These soils are on undeveloped lots and parts of developed lots. In areas where these soils are covered with a thin layer of fill material, it is

more difficult to establish and maintain good lawns than in areas that are not covered. This is because of the lower organic-matter content and less favorable physical properties of the fill material. This thin layer of fill material does not appear to have an adverse effect on the commonly grown trees and shrubs, because their roots extend into the underlying natural surface layer.

The Urban land part of this complex is that land area that is covered with buildings, streets, and driveways. It commonly makes up about one-third of the complex.

The rest of the complex is fill land. Fill land commonly consists of 1 foot to 3 feet of fill material overlying Jimtown soils or the included Fitchville soils. Typically the fill material is from building and street excavations, and it has been spread on the area around the excavated site. Commonly the fill material is thickest near the buildings. It is mainly loamy and consists of subsoil and substratum material from Jimtown soils. In some places this loamy material contains thin layers that are fairly sandy or gravelly, or both. In the included areas of Fitchville soils, the fill material has higher silt content and less sand and gravel than in the areas of Jimtown soils. Also included are small areas of cut land where subsoil or substratum material typical of the Jimtown soils is exposed at the surface. These areas are generally adjacent to streets where cuts were made into the soils for the purpose of establishing grade for the street. Also included are some areas that have more than 3 feet of fill material. These commonly are in the downtown areas, near sites of deep excavations.

The surface layer of fill land commonly has a lower organic-matter content and less favorable physical properties than that of undisturbed areas. Landscaping is generally not difficult in the fill areas, but greater amounts of fertilizer are required to establish and maintain lawns. Surface or subsurface drainage is also needed for good landscaping. This is commonly provided on small lots through the installation of footer drains for the buildings and drains for the streets.

Runoff is slow, and the hazard of erosion is slight. Wetness and moderate to high potential frost action are limitations for many nonfarm uses. Not assigned to a capability unit or a woodland suitability group.

Linwood Series

The Linwood series consists of dark-colored, nearly level organic soils that are very poorly drained. These soils are in bogs and swamps, generally on low-lying terraces and in kettle holes on moraines. They formed in organic deposits 16 to 48 inches in thickness.

In a representative profile, the surface layer is 24 inches of black, dark grayish-brown, and very dark grayish-brown muck. Below this is gray, friable silt loam to a depth of 60 inches.

Linwood soils have moderate to rapid permeability in the muck and moderately slow permeability in the underlying mineral material. The available water capacity is high. These soils have a water table at or near the surface for long periods, unless they have been artificially drained. The rooting zone of these soils is mostly moderately deep in summer when the water table is lowest. The rooting zone is mostly strongly acid to medium acid.

Most areas of Linwood soils have been cleared, but only about half of the areas are drained and cultivated. Some areas are pastured. The potential productivity is high.

Representative profile of Linwood muck in a pasture in Guilford Township, about 1 mile southwest of Seville, 4,500 feet south of the intersection of the farm lane and State Route 3, and 2,000 feet west of Prospect Road:

Oa1—0 to 2 inches, 50 percent dark-brown (7.5YR 3/2) and 50 percent very dark gray (10YR 3/1) sapric material, 50 percent very dark brown (10YR 2/2) when rubbed; about 45 percent fiber, less than 5 percent when rubbed; moderate, medium, crumb structure; sticky; loose; many roots; about 25 percent mineral material; sodium pyrophosphate extract yellowish brown (10YR 5/4); strongly acid; abrupt, smooth boundary.

Oa2—2 to 7 inches, black (N 2/0) broken face sapric material, same color when rubbed; about 5 percent fiber, trace when rubbed; moderate, medium, granular structure; sticky, loose; few roots; about 40 percent mineral material; sodium pyrophosphate extract pale brown (10YR 6/3); strongly acid; abrupt, smooth boundary.

Oa3—7 to 13 inches, black (N 2/0) broken face sapric material, same color when rubbed; less than 5 percent fiber, trace when rubbed; weak, coarse, prismatic structure; friable; few roots; about 50 percent mineral material; sodium pyrophosphate extract brown (10YR 4/3); strongly acid; clear, irregular boundary.

Oa4—13 to 21 inches, 75 percent dark grayish-brown (10YR 4/2) and 25 percent dark reddish-gray (5YR 4/2) broken faces sapric material; dark grayish brown (10YR 4/2) when rubbed; less than 5 percent fiber, trace when rubbed; massive; sticky; friable; about 30 percent mineral material; sodium pyrophosphate extract light brownish gray (10YR 6/2); very strongly acid; clear, smooth boundary.

Oa5—21 to 24 inches, 95 percent very dark grayish-brown (2.5Y 3/2) sapric material; 5 percent gray (N 5/0) broken faces, very dark grayish brown (2.5Y 3/2) when rubbed; about 2 percent fiber, none when rubbed; massive; sticky, loose; slight evidence of bedding; sodium pyrophosphate extract white (10YR 8/1); slightly acid; abrupt, smooth boundary.

IIC1g—24 to 48 inches; gray (N 5/0) silt loam; common, fine, distinct, light olive-brown (2.5Y 5/6) mottles; massive; friable; common fine shells decreasing in quantity with depth; mildly alkaline; strong effervescence; gradual, wavy boundary.

IIC2g—48 to 60 inches; gray (10YR 6/1) silt loam; massive; friable; mildly alkaline; strong effervescence.

The organic material ranges from 16 to 48 inches in thickness, but in most areas it is less than 30 inches thick. The subsurface tier is mainly sapric material. Where the organic material is thicker than 30 inches, the fiber content commonly increases in the lowermost part. Reaction in the organic material is mainly strongly acid or medium acid, but there are thin layers that are very strongly acid or slightly acid. The subsurface tier is mainly black (N 2/0), but it ranges to very dark grayish brown (2.5Y 3/2).

The IIC horizon has hue of 5Y, 2.5Y, 10YR, or N; value of 4 to 6; and chroma of 0 to 2. The texture is light silty clay loam, silt loam, loam, or sandy loam. This horizon is commonly stratified. Content of clay averages less than 35 percent. Content of pebbles is commonly less than 15 percent. Reaction in the IIC horizon ranges from medium acid to mildly alkaline.

Linwood soils are commonly near Carlisle, Willette, Luray, Olmsted, and Sebring soils. They formed in a thinner deposit of organic material than Carlisle soils. They are underlain by loamy material instead of by clayey ma-

terial as are Willette soils. Linwood soils differ from Luray, Olmsted, and Sebring soils by having formed in organic material rather than in mineral material.

Ld—Linwood muck. This nearly level soil commonly occurs around the outer edges of larger areas of Carlisle muck. It is mostly in the southern part of the county along Chippewa Ditch, Little Killbuck Creek, and Killbuck Creek. Most areas are less than 10 acres in size. Some areas are as large as 50 acres; these are mainly in the large muck area south of Lodi. The areas south of Seville, which have the profile described as representative of the series, are as large as 25 acres.

Included with this soil in mapping are a few small areas where the thickness of the organic material is less than 16 inches. In some areas the underlying material includes thin clayey layers.

This soil is susceptible to subsidence if it is drained and if the level of the water table is not controlled. It is also susceptible to soil blowing, especially in open areas when the surface is dry and is not protected by plant cover. If drained, this soil is suited to irrigation and can be used for specialized crops. Drainage outlets are difficult to establish in some areas. Wetness and instability are limitations for most nonfarm uses. Capability unit IIw–6; woodland suitability group 5w1.

Lobdell Series

The Lobdell series consists of nearly level, moderately well drained soils. These soils formed in alluvium. They are on flood plains, mainly along the West Branch and North Branch of the Rocky River and the East Branch of the Black River.

In a representative profile the surface layer is dark grayish-brown silt loam 9 inches thick. The subsoil, to a depth of 32 inches, is brown and dark yellowish-brown, friable silt loam and loam. Grayish-brown and yellowish-brown mottles are below a depth of 22 inches. The underlying material, to a depth of 60 inches, is grayish-brown silt loam.

Lobdell soils have moderate permeability. The available water capacity is high. These soils have a deep rooting zone. They are susceptible to flooding and have an apparent high water table for short periods late in winter and in spring. Runoff is slow.

These soils are used mainly for farming. They have high potential productivity.

Representative profile of Lobdell silt loam in a meadow, in Liverpool Township, about 1,000 feet west of State Route 252 and about 1,200 feet south of the Grafton Road State Route 252 junction:

Ap—0 to 9 inches, dark grayish-brown (10YR 4/2) silt loam; moderate, medium, granular structure; friable; neutral; abrupt, smooth boundary.

B21—9 to 16 inches, brown (10YR 4/3) silt loam; weak, medium, subangular blocky structure; friable; neutral; clear, smooth boundary.

B22—16 to 22 inches, dark yellowish-brown (10YR 4/4) silt loam; weak, coarse, subangular blocky structure; friable; thin, continuous, brown (10YR 4/3) coatings on ped surfaces; slightly acid; clear, smooth boundary.

B3—22 to 32 inches, dark yellowish-brown (10YR 4/4) heavy loam; many, medium, distinct grayish-brown (10YR 5/2) mottles and common, fine, distinct, yellowish-brown (10YR 5/6) weak, coarse, subangular blocky structure; friable; slightly acid; gradual, smooth boundary.

C—32 to 60 inches, grayish-brown (10YR 5/2) silt loam; many, medium, distinct, yellowish-brown (10YR 5/6) mottles; massive; slightly acid.

The A horizon ranges from brown (10YR 4/3) to very dark grayish brown (10YR 3/2). The B horizon, which is commonly 15 to 30 inches thick, is silt loam, loam, fine sandy loam, sandy loam, clay loam, or silty clay loam. The B horizon has hue that ranges from 7.5YR to 2.5Y but typically is 10YR, value of 4 or 5, and chroma of 3 or 4. The lower part of the B horizon is mottled at a depth of 18 to 24 inches. The C horizon is commonly stratified and is sandy loam to silty clay loam. Some gravelly and stony layers are in the C horizon below a depth of 40 inches. The reaction, to a depth of 40 inches, ranges from medium acid to neutral, but some thin, strongly acid layers are in the upper part of the B horizon in some places.

Lobdell soils are most commonly adjacent to the well-drained Chagrin soils and the somewhat poorly drained Orrville soils on flood plains. In a few places the Lobdell soils are adjacent to the wetter Holly soils.

Lc—Lobdell silt loam. This nearly level soil is commonly in long, narrow areas less than 50 acres in size.

Included with this soil in mapping are small areas of Chagrin, Orrville, and Holly soils. Also included are some areas of soils that have a surface layer of loam or fine sandy loam and that is gravelly in places. Other areas have bedrock or a channery soil layer at a depth of about 40 inches.

Flooding is common on this soil late in winter and in spring. Flooding and wetness are limitations for most farm and nonfarm uses. Capability unit IIw–2; woodland suitability group 1o1.

Lorain Series

The Loran series consists of nearly level, very poorly drained soils that have a dark-colored surface layer. These soils formed in lakebed deposits. They are in low-lying areas on the landscape, mainly along Chippewa Ditch and Little Killbuck Creek. These soils are in depressional areas that receive runoff from the adjacent higher lying areas.

In a representative profile in a pasture, the surface layer is black silty clay loam 6 inches thick. The subsurface layer is black silty clay 3 inches thick. The subsoil extends to a depth of 50 inches. The upper 30 inches is mottled dark-gray, gray, and grayish-brown firm silty clay. The lower part of the subsoil and the upper 6 inches of the substratum are mottled gray and greenish-gray silty clay loam. The underlying material, to a depth of 60 inches, is olive silt loam.

Lorain soils have slow permeability. The available water capacity is high. These soils have a moderately deep rooting zone when the seasonal water table is low. This perched water table is high for extended periods, and in some areas water stands on the surface. Organic-matter content is high, and tilth is generally good.

Most areas of these soils lack sufficient artificial drainage for the growing of cultivated crops. Pasture and wetland wildlife habitat are the most common uses made of these soils. If adequately drained, these soils have moderate potential productivity.

Representative profile of Lorain silty clay loam in Harrisville Township, about 1,000 feet east of Willow Road and Garden Isle Road junction and 400 feet south of Willow Road:

A1p—0 to 6 inches, black (10YR 2/1) heavy silty clay loam; moderate, medium, granular structure; fri-

able; many roots; 1 percent pebbles; medium acid; abrupt, smooth boundary.

A12g—6 to 9 inches, black (10YR 2/1) silty clay; common, fine, distinct, olive-brown (2.5Y 4/4) mottles; weak, medium, angular blocky structure; friable; common roots; 1 percent pebbles; medium acid; clear, smooth boundary.

B1g—9 to 17 inches, dark-gray (10YR 4/1) silty clay; many, fine, distinct, dark yellowish-brown (10YR 4/4) mottles; moderate, medium, prismatic structure parting to moderate, medium, angular blocky; firm; plastic and sticky; few roots; thin, continuous, dark-gray (10YR 4/1) coatings on ped surfaces; 1 percent pebbles; few, fine, dark concretions; strongly acid; clear, wavy boundary.

B21tg—17 to 21 inches, gray (10YR 5/1) silty clay; many, fine, distinct, dark yellowish-brown (10YR 4/4) mottles; moderate, medium, prismatic structure parting to moderate, medium, angular blocky; firm; plastic and sticky; few roots; thin, continuous, gray (10YR 5/1) coatings on ped surfaces; thin, very patchy, dark-gray (10YR 4/1) clay films in pores and on ped surfaces; 1 percent pebbles; few, fine, dark concretions; strongly acid; clear, wavy boundary.

B22tg—21 to 29 inches, grayish-brown (2.5Y 5/2) light silty clay; many, fine, prominent, strong-brown (7.5YR 5/6) mottles; weak, coarse, prismatic structure parting to weak, coarse, angular blocky; firm; plastic and sticky; few roots; thin, continuous, gray (10YR 5/1) coatings on root and worm channels; thin, very patchy, grayish-brown (2.5Y 5/2) clay films on ped surfaces; 1 percent pebbles; few, fine, dark concretions; strongly acid; clear, wavy boundary.

B23tg—29 to 39 inches, grayish-brown (10YR 5/2) light silty clay; many, fine, distinct, dark yellowish-brown (10YR 4/4) mottles and common, coarse, distinct, strong-brown (7.5YR 5/6) mottles; weak, coarse, prismatic structure parting to weak, coarse, subangular blocky; firm; plastic and sticky; few roots; thin, continuous, gray (10YR 5/1) coatings in root and worm channels; thin, patchy, grayish-brown (10YR 5/2) clay films on ped surfaces; 1 percent pebbles; common, medium, dark stains and concretions; strongly acid; gradual, smooth boundary.

B3g—39 to 50 inches, gray (N 5/0) heavy silty clay loam; many, fine, prominent, dark yellowish-brown (10YR 4/4) mottles; weak, coarse, prismatic structure parting to weak, coarse, subangular blocky; firm; plastic and sticky; few, fine, dark concretions; medium acid; gradual, wavy boundary.

C1—50 to 56 inches, greenish-gray (5BG 5/1) heavy silty clay loam; common, medium, distinct, olive (5Y 4/4) mottles; massive; neutral; gradual, wavy boundary.

C2—56 to 60 inches, olive (5Y 4/4) silt loam; many, common, distinct, greenish-gray (5BG 5/1) mottles; massive; neutral.

The solum ranges from 30 to 55 inches in thickness. The A horizon is black (10YR 2/1) to very dark grayish brown (10YR 3/2). The B horizon is silty clay or heavy silty clay loam and has distinct or prominent mottles. It is mainly strongly acid, but in some layers it is medium acid to neutral. The C horizon is commonly stratified and ranges from sandy loam to silty clay loam. It is typically neutral but grades to mildly alkaline and is calcareous at a depth of about 4 to 6 feet.

Lorain soils are most commonly adjacent to very poorly drained Luray and Carlisle soils, poorly drained Canadice soils, and somewhat poorly drained Jimtown soils. They are more clayey than Luray and Carlisle soils. They have a darker A horizon than Canadice and Jimtown soils. Lorain soils are mineral, and Carlisle soils are organic. Lorain soils are similar to Miner soils, but Lorain soils are underlain by stratified lakebed deposits instead of glacial till.

Ln—Lorain silty clay loam. This nearly level soil typically is in broad, oblong areas on low-lying, lacustrine terraces. Most areas of this soil are along Little Killbuck Creek and Chippewa Ditch and are less than 30 acres in size.

Included with this soil in mapping are areas of soils that have a thin organic surface layer less than 12 inches thick. These areas are mainly in the large area along Chippewa Ditch. A narrow strip adjacent to Chippewa Ditch is susceptible to flooding. Because of flooding, this narrow strip has 10 to 20 inches of alluvium deposited on its surface. Also included are small areas of soils that have a dark-colored surface layer slightly more than 10 inches thick.

This soil is severely limited by wetness. The water table is on or near the surface during most of the year. Runoff is slow. Ponding is common. Most areas are not adequately drained for cultivated crops; thus swamp grasses and sedges are common. Some areas are used for late summer pasture. Wetness, a clayey texture, and slow permeability are limitations for most nonfarm uses. Capability unit IIIw–1; woodland suitability group 2w1.

Loudonville Series

The Loudonville series consists of gently sloping to steep, well-drained soils. These soils formed in glacial till and in the underlying residuum for siltstone and sandstone bedrock. The bedrock is at a depth of 20 to 40 inches. These soils are on uplands, mainly in the eastern and northeastern parts of the county.

In a representative profile in a cultivated area, the plow layer is dark grayish-brown silt loam 8 inches thick. The subsoil, between depths of 8 and 28 inches, is yellowish-brown, friable silt loam. Fractured sandstone bedrock is at a depth of 28 inches.

Loudonville soils have moderate permeability. The available water capacity is low to moderate. These soils have a moderately deep rooting zone. They dry out and warm up quickly in spring.

Most of the Loudonville soils have been cultivated, but they are most commonly used for pasture or meadow. The potential productivity is moderate. Some areas have reverted to woodland.

Representative profile of Loudonville silt loam, 12 to 25 percent slopes, moderately eroded, in an idle crop field in Sharon Township, about 0.8 mile north of Sharon Center, and about 200 feet west of State Route 94:

Ap—0 to 8 inches, dark grayish-brown (10YR 4/2) silt loam; 35 percent yellowish-brown (10YR 5/4) subsoil; moderate, fine and medium, granular structure; friable; many roots; 10 percent coarse fragments as large as 3 inches in diameter; medium acid; abrupt, irregular boundary.

B1—8 to 12 inches, yellowish-brown (10YR 5/4) silt loam; 20 percent dark brown (10YR 4/3) tonguing from the Ap horizon; moderate, medium, subangular blocky structure; friable; common roots; 10 percent coarse fragments as large as 3 inches in diameter; strongly acid; clear, smooth boundary.

B21t—12 to 20 inches, yellowish-brown (10YR 5/4) silt loam; many, coarse, faint, brown (7.5YR 5/4) mottles; moderate, medium and coarse, subangular blocky structure; friable; common roots; thin, very patchy, clay films on ped surfaces; 10 percent coarse fragments as large as 3 inches in diameter; very strongly acid; clear, smooth boundary.

B22t—20 to 28 inches, yellowish-brown (10YR 5/4) silt loam; moderate, medium and coarse, subangular blocky structure; friable; few roots; thin, patchy clay films; thin, patchy, brown (10YR 5/3) coatings on ped surfaces; 10 percent coarse fragments as large as 3 inches in diameter; strongly acid; abrupt, irregular boundary.

IIR—28 inches, very pale brown (10YR 7/3) fractured sandstone.

Thickness of the solum and depth to bedrock range from 20 to 40 inches. Reaction is medium acid to very strongly acid. The Ap horizon is dark grayish brown (10YR 4/2) or dark brown (10YR 4/3). In undisturbed areas the A1 horizon is 1 inch to 4 inches thick and is very dark grayish-brown (10YR 3/2) and dark grayish brown (10YR 4/2). The A2 horizon is 3 to 7 inches thick and is brown (10YR 5/3), yellowish brown (10YR 5/4), or dark brown (10YR 4/3). The Bt horizon ranges from 12 to 30 inches in thickness. It has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6. It is dominantly silt loam but is loam, clay loam, or silty clay loam in places. Some profiles have a IIB horizon as thick as 5 inches, which formed in material weathered from the underlying bedrock. If the IIB horizon is not present, the volume of coarse fragments in the layers above the bedrock is less than 15 percent. The upper layers of bedrock are fractured.

Loudonville soils are on landscapes with Wooster, Canfield, Rittman, Ellsworth, Geeburg, Berks, and Schaffenaker soils. They are shallower to bedrock than any of these soils except Berks and Schaffenaker soils, which formed entirely in residual material. Loudonville soils lack a fragipan common to Wooster, Canfield, and Rittman soils. They are better drained and have a less clayey B horizon than Ellsworth and Geeburg soils.

LoB—Loudonville silt loam, 2 to 6 percent slopes. This gently sloping soil is on ridgetops and upper parts of hillsides. It is in all the major upland areas in the eastern part of the county. Most areas are either irregular or elongated in shape and are less than 20 acres in size. This soil has a profile that is slightly deeper to bedrock than the one described as representative of the series. Because of the slightly higher organic-matter content, available water capacity, and natural fertility, this soil is better suited to plants than are the more sloping, eroded Loudonville soils.

Included with this soil in mapping are a few spots of Wooster, Canfield, Rittman, and Ellsworth soils. There are a few included spots of soils that are moderately eroded. Also included are a few wet spots that are shown on the soil map by a special symbol.

A moderate hazard of erosion is the major limitation to the use of this soil for cultivated crops. Runoff is medium. Moderate depth to bedrock is a limitation for some nonfarm uses. Capability unit IIe-4; woodland suitability group 2o1.

LoC—Loudonville silt loam, 6 to 12 percent slopes. This sloping soil is in elongated areas on the upper part of hillsides and ridgetops. Most areas are less than 75 acres in size. The slopes are mostly less than 400 feet in length. This soil has been protected from erosion. Organic-matter content, available water capacity, and natural fertility are more favorable for plants on this soil than on eroded soils.

Included with this soil in mapping are small eroded spots, small areas of Berks soils, and a few seep spots. Also included are a few areas where the soil formed entirely in residuum from sandstone or shale bedrock.

Most areas of this soil are wooded. If cultivated, this soil is subject to a severe hazard of erosion. Moderate depth to bedrock and slope are limitations for some nonfarm uses. Capability unit IIIe-3; woodland suitability group 2o1.

LoC2—Loudonville silt loam, 6 to 12 percent slopes, moderately eroded. This sloping soil is in convex areas on ridgetops and on the upper parts of hillsides. Most areas are elongated and are less than 25 acres in size. Slopes are generally less than 300 feet long. Many pebbles and fragments of sandstone are on the surface. The organic-matter content and the available water capacity of the surface layer have been lowered by the effects of erosion.

Included with this soil in mapping are spots of severely eroded soils and a few sandstone bedrock outcrops. Also included are spots of soils that formed entirely in residuum from sandstone.

Runoff is rapid and there is a severe hazard of erosion in cultivated areas. Depth to bedrock and slope are limitations for some nonfarm uses. Capability unit IIIe-3; woodland suitability group 2o1.

LoE2—Loudonville silt loam, 12 to 25 percent slopes, moderately eroded. This moderately steep to steep soil is on upland hillsides. Slopes are mostly less than 500 feet in length. This soil is typically dissected by several drainageways. Most areas of this soil are less than 50 acres in size. This soil has the profile described as representative of the series.

Included with this soil in mapping are small spots of rock outcrop, a few wet spots, and small areas of Berks soils. Also included are areas of soils that formed entirely in residuum from sandstone or shale bedrock. Some areas, mostly below sandstone outcrop ledges, have sandstone boulders on the surface.

Most areas of this soil are in woodland. In past years many of these areas were pastured and allowed to erode. Because runoff is very rapid, the hazard of erosion is very severe. Slope and moderate depth to bedrock are limitations for most nonfarm uses. Capability unit IVe-4; woodland suitability group 2r1.

Luray Series

The Luray series consists of very poorly drained, nearly level soils. These soils formed in material deposited by water. These soils are in positions that were once occupied by glacial lakes and swamps. They are typically on low, broad terraces and in small, shallow depressions on the uplands.

In a representative profile in a cultivated area, the plow layer is very dark gray silt loam 10 inches thick. The subsoil, between depths of 10 and 38 inches, is mottled, gray and light brownish-gray, firm silt loam and silty clay loam. The underlying material, to a depth of 63 inches, is mottled, gray silt loam.

Luray soils have moderately slow permeability. The available water capacity is high. These soils have a seasonal high water table that remains near the surface for long periods. The water table is mainly apparent. Where these soils are adequately drained, the rooting zone is deep. The rooting zone is acid. These soils are slow to dry out and warm up in spring.

Most areas of these soils have been cleared and are being farmed. Areas that lack adequate artificial drainage for farming have reverted to natural swamp-type vegetation. Some of these areas are used for late sum-

mer pasture. The potential productivity is moderate to high.

Representative profile of Luray silt loam in a meadow field in Harrisville Township, about 1.6 miles south of Lodi, about 0.5 mile south of the junction of Lodi Road and Franchester Road and about 1,750 feet east of Lodi Congress Road:

Ap—0 to 10 inches, very dark gray (10YR 3/1) silt loam; moderate, medium, granular structure; friable; many roots; slightly acid; abrupt, smooth boundary.

B1g—10 to 14 inches, gray (5Y 6/1) silt loam; common, medium, prominent, yellowish-brown (10YR 5/8) mottles; moderate, medium, prismatic structure; firm; common roots; organic stains on vertical faces and interiors of root channels; medium acid; abrupt, smooth boundary.

B21tg—14 to 18 inches, light brownish-gray (2.5Y 6/2) silt loam; common, medium, distinct, yellowish-brown (10YR 5/8) mottles; weak, coarse, prismatic structure parting to moderate, medium, subangular blocky; firm; common roots; thin, very patchy clay films on ped surfaces and interiors; strongly acid; clear, smooth boundary.

B22tg—18 to 24 inches, gray (5Y 6/1) silt loam; many, fine and medium, prominent, yellowish-brown (10YR 5/4) mottles and common, medium, prominent, dark-brown (7.5YR 4/4) mottles; weak, coarse, prismatic structure parting to moderate, coarse, subangular blocky; firm; few roots; few, very patchy clay films on ped surfaces; few, medium, black (10YR 2/1) stains; very strongly acid; gradual, smooth boundary.

B23tg—24 to 34 inches, light brownish-gray (2.5Y 6/2) silty clay loam; many, fine, prominent, dark-brown (7.5YR 4/4) mottles; moderate, coarse, prismatic structure parting to moderate, coarse, subangular blocky; firm; few roots; thin, very patchy clay films on ped surfaces and interiors; common, medium, black (10YR 2/1) stains; strongly acid; gradual, smooth boundary.

B3tg—34 to 38 inches, gray (5Y 5/1) silt loam; common, medium, prominent, strong-brown (7.5YR 5/6) mottles; weak, coarse, prismatic structure; firm; thin, patchy clay films on ped surfaces; many, medium, black (10YR 2/1) stains on ped surfaces and on root and worm channels; strongly acid; gradual, smooth boundary.

C—38 to 63 inches, gray (5Y 6/1) silt loam; common, medium, prominent, strong-brown (7.5YR 5/6) mottles; massive; firm; strongly acid.

Thickness of the solum ranges from 30 to 55 inches but is typically less than 42 inches. Reaction in the solum is predominantly strongly acid but there are thin layers that are very strongly acid, medium acid, or slightly acid. The less acid reactions are common in the surface layer and the lower part of the subsoil.

The Ap and A1 horizons range from 10 to 13 inches in thickness and are black (10YR 2/1), very dark brown (10YR 2/2), very dark gray (10YR 3/1), or very dark grayish brown (10YR 3/2). Texture is mostly silt loam but includes silty clay loam. The B horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 0 to 2. It is silt loam or silty clay loam. Stratification is common in the C horizon. Texture ranges from sandy loam to silty clay, but silt loam and silty clay loam are dominant.

Luray soils in Medina County are slightly more acid than Luray soils mapped elsewhere. This difference, however, does not alter their usefulness and behavior.

Luray soils are the very poorly drained member of a drainage sequence that includes the moderately well drained Glenford soils, the somewhat poorly drained Fitchville soils, and the poorly drained Sebring soils. They are commonly adjacent to Lorain, Carlisle, Willette, and Sebring soils. Luray soils contain less clay than Lorain soils. They lack the high organic-matter content common to Carlisle and Willette soils, and they have a darker A horizon than Sebring, Fitchville, and Glenford soils.

Ly—Luray silt loam. This nearly level soil is on a broad glacial basin that is about 1,000 acres in size. It also is in a few fairly small, round basins that receive deposition from surrounding areas; and in long, narrow strips, 5 to 15 acres in size, along drainageways.

Included with this soil in mapping are areas of soils that have a thinner surface layer than this Luray soil. Also included are thin, mucky areas, small areas of soils that have a surface layer of silty clay loam, and a few small spots of soils that have thin layers of sandy loam or loam in the subsoil.

Excessive wetness is a severe limitation to the use of this soil for cultivated crops. This wetness, slow permeability, soft and compressible soil material, and high potential frost action are limitations for most nonfarm uses. Capability unit IIw–5; woodland suitability group 2w1.

Mahoning Series

The Mahoning series consists of nearly level to gently sloping, somewhat poorly drained soils. These soils formed in glacial till on uplands. They are the most extensive soils in the northern and western parts of the county.

In a representative profile the surface layer is dark grayish-brown silt loam 9 inches thick. The subsoil, between depths of 9 and 34 inches, is mainly mottled dark yellowish-brown, firm silty clay loam. The underlying material, between depths of 34 and 67 inches, is mottled dark-brown and dark grayish-brown silty clay loam.

Mahoning soils have slow to very slow permeability. The available water capacity is moderate. These soils are seasonally wet for long periods. Because of this, these soils are slow to dry out and warm up in spring. The water table is low and commonly represents a low quantity of water. Where adequately drained, these soils have a moderately deep rooting zone. The rooting zone is acid. The subsoil is plastic and sticky when wet. During dry periods these soils become hard, and cracks 1 inch to 2 inches wide form at the surface. These cracks extend to a depth of 3 to 4 feet.

Most areas of these soils have been cleared and are being farmed. Artificial drainage is necessary for most farm crops. The potential productivity is moderate.

Representative profile of Mahoning silt loam, 2 to 6 percent slopes, in a formerly cultivated field in the city limits of Brunswick, about 1,800 feet north of State Route 303 and 2,000 feet east of Substation Road (sample MD–14 in laboratory data section):

Ap—0 to 9 inches, 95 percent dark grayish-brown (2.5Y 4/2) and 5 percent yellowish-brown (10YR 5/4) silt loam; moderate, medium, granular structure; friable; 2 percent pebbles; strongly acid; abrupt, smooth boundary.

B21t—9 to 14 inches, grayish-brown (2.5Y 5/2) silty clay loam; many, medium, distinct, yellowish-brown (10YR 5/6) mottles; moderate, medium, subangular blocky structure; firm; light brownish-gray (2.5Y 6/2) silt coatings; thin, patchy clay films on ped surfaces; thin, very patchy, grayish-brown (2.5Y 5/2) clay films in pores; 3 percent pebbles; very strongly acid; clear, smooth boundary.

B22t—14 to 22 inches, dark yellowish-brown (10YR 4/4) heavy silty clay loam; many, medium, distinct,

grayish-brown (2.5Y 5/2) mottles; moderate, medium, subangular blocky; firm; thin, continuous, gray (10YR 5/1) clay films on horizontal and vertical faces; few black (10YR 2/1) stains; 3 percent pebbles; very strongly acid; clear, smooth boundary.

B23t—22 to 30 inches, dark yellowish-brown (10YR 4/4) heavy silty clay loam; many, medium, distinct, grayish-brown (2.5Y 5/2) mottles and common, medium, distinct, yellowish-brown (10YR 5/6) mottles; moderate, coarse, prismatic structure parting to weak, coarse, subangular blocky; firm; thin to medium, continuous, gray (5Y 5/1) clay films on vertical ped surfaces; few black (10YR 2/1) stains; 3 percent pebbles; slightly acid; clear, smooth boundary.

B3t—30 to 34 inches, dark-brown (10YR 4/3) silty clay (2.5Y 5/2) mottles; weak, coarse, prismatic structure parting to weak, thick, platy; firm; thin, patchy, grayish-brown (2.5Y 5/2) clay films on vertical faces; 3 percent pebbles; mildly alkaline; clear, wavy boundary.

C1—34 to 45 inches, dark-brown (10YR 4/3) silty clay loam; common, medium, prominent, gray (5Y 5/1) mottles and few medium, distinct, yellowish-brown (10YR 5/6) mottles; weak, thick, platy structure; very firm; thin, very patchy, dark-gray (5Y 4/1) clay films; 5 percent pebbles; moderately alkaline; slight effervescence; gradual, wavy boundary.

C2—45 to 67 inches, dark grayish-brown (10YR 4/2) silty clay loam; few, fine, distinct, yellowish-brown (10YR 5/6) and gray (5Y 5/1) mottles; massive; firm; 5 percent pebbles; moderately alkaline; slight effervescence.

Thickness of the solum ranges from 28 to 44 inches. Content of coarse fragments is as much as 10 percent in the solum. The Ap horizon is dark grayish brown (10YR 4/2 or 2.5Y 4/2) or dark brown (10YR 4/3). In undisturbed areas there is an A1 horizon, 1 inch to 4 inches thick, that is very dark grayish brown (10YR 3/2), dark grayish brown (10YR 4/2), or dark gray (10YR 4/1). An A2 horizon commonly underlies the A1 horizon; it is grayish brown (10YR 5/2), brown (10YR 5/3), or light brownish gray (10YR 6/2). Some profiles have a B1 horizon, 2 to 4 inches thick, that is yellowish brown (10YR 5/4 or 5/6.)

The Bt horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 to 4. Low-chroma mottles and coatings are dominant on the ped surfaces. Texture is dominantly heavy silty clay loam but is clay loam, clay, or silty clay in places. Reaction is very strongly acid to strongly acid in the upper part of the Bt horizon and medium acid to mildly alkaline in the lower part. The C horizon is clay loam or silty clay loam. It is dark grayish brown (10YR 4/2), dark brown (10YR 4/3), or dark yellowish brown (10YR 4/4) and has mottles of both high and low chroma.

Mahoning soils are the somewhat poorly drained members of a drainage sequence that includes moderately well drained Ellsworth soils, poorly drained Condit soils, and very poorly drained Miner soils. They are adjacent to some small areas of Fitchville and Jimtown soils. Mahoning soils are more clayey than either Fitchville or Jimtown soils and contain more coarse fragments than Fitchville soils. They are similar to Bennington and Caneadea soils. Mahoning soils differ from Bennington soils by having stronger profile development and moderate to strong, prismatic structure. They formed in glacial till, but Caneadea soils formed in lacustrine material.

MgA—Mahoning silt loam, 0 to 2 percent slopes. This nearly level soil is on broad, flat uplands. It is the dominant soil in the northwestern part of the county. Some areas are as large as 1,000 acres or more in size.

Included with this soil in mapping are small areas of darker colored, very poorly drained Miner soils and poorly drained Condit soils; these soils are in depressional areas and in low areas along drainageways. In some places the upper part of the subsoil of these soils has more silt and less clay than this Mahoning soil. Also included are small areas of soils that have bedrock at a depth of 5 to 6 feet.

Unless adequate drainage is provided, seasonal wetness is a severe limitation to the use of this soil for farming. Runoff is slow, and ponding is common. Erosion is generally not a hazard. Seasonal wetness, slow permeability, and a subsoil that is sticky and plastic when wet are limitations for most nonfarm uses. Capability unit IIIw–4; woodland suitability group 2w3.

MgB—Mahoning silt loam, 2 to 6 percent slopes. This gently sloping soil is on low knolls, ridgetops, and short side slopes along drainageways. This is the predominant soil in the convex and concave areas on undulating landscapes in Medina, Brunswick, and Liverpool Townships. Most areas are irregular in shape, but some areas are broad and are as large as 1,000 acres. This soil has the profile described as representative of the series.

Included with this soil in mapping are small areas of Ellsworth soils, which are typically in the more rolling areas. These soils are commonly moderately eroded. Also included are small spots of poorly drained Condit soils and very poorly drained Miner soils, which are mainly in shallow drainageways of depressions and where seeps form in sloping areas. There are also small areas of soils that have bedrock at a depth of 5 to 6 feet.

Runoff is medium to rapid. On long slopes there is some internal lateral movement of water. This water tends to collect in low spots or forms seeps at or near the base of slopes. Seasonal wetness is a severe limitation to the use of this soil for cultivated crops. This soil has slow permeability and is plastic and sticky when wet. These are limitions for most nonfarm uses. Capability unit IIIw–4; woodland suitability group 2w3.

MlA—Mahoning silt loam, sandstone substratum, 0 to 2 percent slopes. This nearly level soil is on uplands. It is underlain by sandstone or siltstone bedrock at a depth of 40 to 60 inches. The soil formed mostly in glacial till. It commonly has no calcareous soil material between the subsoil and the bedrock. Areas of this soil typically are along drainageways. They are irregular in shape and range from 3 acres to about 30 acres in size.

Included with this soil in mapping are spots of soils where the depth to bedrock is slightly less than 40 inches.

Seasonal wetness is a severe limitation if this soil is used for cultivated crops. Erosion is generally not a hazard, because runoff is slow. Seasonal wetness, slow permeability, and soil material that is sticky and plastic when wet are limitations for most nonfarm uses. For some uses, the depth to underlying bedrock is a limitation. Capability unit IIIw–4; woodland suitability group 2w3.

MlB—Mahoning silt loam, sandstone substratum, 2 to 6 percent slopes. This gently sloping soil is on uplands. It is underlain by sandstone or siltstone bedrock starting at a depth between 40 and 60 inches. This soil commonly has no calcareous soil material between the subsoil and the bedrock. It commonly is on knolls and short side slopes adjacent to drainageways. Most areas

of this soil are irregular in shape and less than 25 acres in size.

Included with this soil in mapping are small eroded spots and small areas of soils where depth to bedrock is slightly less than 40 inches.

Wetness is a severe limitation to the use of this soil for cultivated crops. If the soil is cropped, hazard of erosion is also a limitation. Runoff is medium to rapid. Seasonal wetness, slow permeability, and soil material that is sticky and plastic when wet are limitations for many nonfarm uses. For some uses, the depth to underlying bedrock is a limitation. Capability unit IIIw-4; woodland suitability group 2w3.

MnA—Mahoning-Urban land complex, nearly level. This nearly level soil complex consists of areas where much of the natural soil has been altered or covered as the result of grading and digging. Typically, this reshaping of the landscape has reduced grades by filling the low areas and by cutting down the higher knolls. Most areas are in Brunswick and Medina Townships and are urbanized or developed for industry. Even though most of the complex has been disturbed, about one-third of the unit is composed of undisturbed Mahoning soils on undeveloped lots and small parts of developed lots. In some areas the undisturbed part consists mainly of Condit soils.

About one-third of the complex is of fill and cut land. The fill areas commonly consist of about 1 foot to 3 feet of fill material overlying undisturbed Mahoning soils or the included Condit soils. Typically, the fill material from basement excavations has been spread on the lot adjacent to the excavated area. This fill material consists mostly of Mahoning subsoil and substratum material. Cut areas are characterized by exposed subsoil or substratum material typical of the Mahoning soils. Commonly, these areas are adjacent to streets, which were cut into the landscape.

The Urban land part of this complex is those areas that are occupied by buildings, streets, and driveways. This commonly makes up about one-third of the complex.

The surface layer, in disturbed areas, commonly has a low organic-matter content and is in poor physical condition. In some places glacial till is exposed at or near the surface. Proper landscaping of these limy, compact areas is difficult. The surface layer is susceptible to crusting following rains, and it has a narrow range of moisture content suitable for optimum tillage.

Seasonal wetness is a limitation to the use of this complex, particularly where grading has resulted in depressional or bowl-shaped areas. The hazard of erosion is severe, particularly where the soil is sloping and is bare of vegetation during construction periods. Both gullying and sedimentation can occur during this period unless erosion and sediment control practices are used. Basement walls commonly crack unless they are adequately reinforced. Not assigned to a capability unit or a woodland suitability group.

Miner Series

The Miner series consists of dark-colored, very poorly drained, nearly level soils. These soils formed in glacial till on uplands throughout the county. They are in depressional areas and low-lying areas along small natural drainageways.

In a representative profile in a cultivated field, the plow layer is very dark grayish-brown light silty clay loam 8 inches thick. Below the plow layer, to a depth of 13 inches, is mottled, dark-gray, firm silty clay loam. The subsoil extends to a depth of 50 inches. The upper 2 inches is mottled, gray, firm silty clay. The lower 12 inches is mottled olive-gray, firm silty clay loam. The underlying material, between depths of 50 and 70 inches, is mottled, dark-brown, very firm silty clay loam.

These soils have slow to very slow permeability. The available water capacity is high. These soils have a moderately deep rooting zone. They have a perched seasonal high water table and are susceptible to occasional ponding.

Many areas of these soils are drained and farmed with the adjacent soils. Areas that are not adequately drained are in pasture or woodland. Productivity is generally moderate if adequate artificial drainage is provided.

Representative profile of Miner silty clay loam in Spencer Township, about 3,000 feet east of State Route 301 and 1,000 feet north of old Mill Road:

Ap—0 to 8 inches, very dark grayish-brown (10YR 3/2) light silty clay loam; weak, fine, granular structure; friable; many roots; 1 percent coarse fragments; neutral; abrupt, smooth boundary.

B1—8 to 13 inches, dark-gray (10YR 4/1) silty clay loam; many, medium, distinct, olive-brown (2.5Y 4/4) mottles and common, fine, prominent, strong-brown (7.5YR 5/6) mottles; weak, medium, subangular blocky structure; firm; common roots; common, fine, black (10YR 2/1) concretions; 1 percent coarse fragments; slightly acid; clear, smooth boundary.

B21tg—13 to 26 inches, gray (10YR 5/1) light silty clay; common, fine, distinct, light olive-brown (2.5Y 5/4) mottles and many, fine, prominent strong-brown (7.5YR 5/6) mottles; weak, coarse, prismatic structure parting to moderate, medium, angular blocky; firm; common roots; thin, patchy clay films on ped surfaces; dark-gray (10YR 4/1) soil material in root channels; common, fine, black (10YR 2/1) concretions; about 1 percent coarse fragments; medium acid; clear, smooth boundary.

B22tg—26 to 38 inches, gray (N 5/0) light silty clay; many, fine, prominent, yellowish-brown (10YR 5/6) mottles and common, fine, distinct, light olive-gray (5Y 6/2) mottles; weak, coarse, prismatic structure parting to weak, coarse, angular blocky; firm; few roots; thin, patchy clay films on ped surfaces; common, fine, black (10YR 2/1) concretions; 3 percent coarse fragments; slightly acid; clear, wavy boundary.

B3t—38 to 50 inches, olive-gray (5Y 5/2) heavy silty clay loam; many, fine, distinct, pale-olive (5Y 6/4) mottles and many, medium, prominent, yellowish-brown (10YR 5/6) mottles; weak, coarse, prismatic structure parting to weak, coarse, subangular blocky; firm; medium, patchy clay films on ped surfaces; 1 percent coarse fragments; neutral; clear, wavy boundary.

C—50 to 70 inches, dark-brown (10YR 4/3) silty clay loam; many, medium, distinct, gray (10YR 6/1) mottles and many, medium, distinct, white (10YR 8/1) calcareous coatings; massive; very firm; 5 percent coarse fragments; mildly alkaline; moderate effervescence.

The Ap horizon ranges from 6 to 10 inches in thickness and is very dark gray (10YR 3/1) or very dark grayish brown (10YR 3/2). The B horizon ranges from silty clay

loam to light silty clay. It has hue of 10YR to 5Y or N value of 4 to 6, and chroma of 0 to 2. Reaction is medium acid to slightly acid in the upper part of the B horizon and slightly acid to neutral in the lower part. The C horizon is silty clay loam or clay loam. It has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 1 to 4. Depth to carbonates ranges from 36 to 60 inches. Content of coarse fragments, mainly siliceous sedimentary fragments, ranges from 2 to 10 percent throughout.

Miner soils are on a landscape that includes moderately well drained Ellsworth soils, somewhat poorly drained Mahoning soils, and poorly drained Condit soils. They have a thicker, darker colored A horizon than these soils. Miner and Lorain soils are similar, but Miner soils are underlain by glacial till and lack evidence of stratification common to the lacustrine material underlying Lorain soils.

Mr—Miner silty clay loam. This nearly level soil is in depressional areas on till plains. Areas of this soil are typically less than 10 acres in size and are irregular to oblong in shape. This soil is throughout Medina County. Areas of this soil that lie in the southern and southeastern parts of the county commonly contain less clay than those in other parts of the county.

Included with this soil in mapping are a few small areas of soils that have a surface layer of silt loam. These soils are affected by material washed from adjacent higher lying soils, and they commonly have a lighter colored surface layer. Also included are a few areas of soils that are less clayey than this miner soil.

Most areas of this soil are used for crops, permanent pasture, or woodland. Artificial drainage is needed for crops. Both surface and subsurface drainage are commonly required. This soil is soft and sticky when wet and becomes very hard when dry. It is commonly referred to locally as "gumbo" or "blue clay." Some areas lack natural outlets for drainage. These wetter areas are often ponded during the wet season, and the main vegetation is swamp grasses, cattails, and a few water-tolerant trees. Excessive wetness is the main limitation to the use of this soil for farming. A clayey subsoil and a seasonal high water table are limitations for most nonfarm uses. Capability unit IIIw-1; woodland suitability group 2w1.

Olmsted Series

The Olmsted series consists of nearly level, very poorly drained soils. These soils formed in glacial outwash. They are in slight depressions on terraces throughout the county.

In a representative profile the plow layer is very dark brown loam about 9 inches thick. The subsoil extends to a depth of 46 inches. The upper 13 inches is mottled, gray and grayish-brown, firm sandy clay loam. The lower 24 inches is mottled, gray and grayish-brown, firm gravelly sandy clay loam and gravelly clay loam. Stratified layers underlie the subsoil at depths between 46 and 78 inches. They are mottled, light brownish-gray and grayish-brown gravelly loam, silt loam, and gravelly sandy clay loam.

Undrained Olmsted soils have a high apparent water table in winter and spring and early in summer that commonly represents a large quantity of water. If drained, they have a moderately deep rooting zone and high potential productivity. Permeability is moderate to moderately rapid, and the available water capacity is high.

Representative profile of Olmsted loam in a cornfield in Westfield Township, 200 feet west of Stuckey Road and Daniels Road junction and 500 feet south of Stuckey Road:

Ap—0 to 9 inches, very dark brown (10YR 2/2) loam; moderate, fine, granular structure; friable; common roots; 5 percent gravel; neutral, abrupt, smooth boundary.

B1g—9 to 14 inches, gray (10YR 5/1) sandy clay loam; many, fine, distinct, yellowish-brown (10YR 5/4) mottles and common, fine, distinct, brown (10YR 5/3) mottles; weak, medium, subangular blocky structure; firm; few roots; root and worm channels filled with dark-gray (10YR 4/1) soil material; 8 percent gravel; few, fine, dark stains; medium acid; clear, wavy boundary.

B21tg—14 to 22 inches, grayish-brown (10YR 5/2) sandy clay loam; many, medium, distinct, strong-brown (7.5YR 5/6) mottles; weak, medium, subangular blocky structure; firm; few roots; thin, continuous, gray (10YR 5/1) coatings on ped surfaces; thin, patchy clay films on ped surfaces and bridging sand grains; 10 percent gravel; few, fine, dark stains; strongly acid; clear, wavy boundary.

B22tg—22 to 36 inches, gray (10YR 6/1) gravelly sandy clay loam; common, fine, distinct, strong-brown (7.5YR 5/6) mottles; weak, coarse, subangular blocky structure; firm; few roots; thin, patchy clay films on ped surfaces and bridging sand grains; 16 percent gravel; few, fine, dark stains; strongly acid; clear, smooth boundary.

B3tg—36 to 46 inches, grayish-brown (10YR 5/2) gravelly clay loam; many, medium, faint, gray (10YR 5/1) mottles and common, medium, distinct, strong-brown (7.5YR 5/8) mottles; weak, coarse, subangular blocky structure; firm; thin, patchy clay films on ped surfaces and in voids; 20 percent gravel; medium acid; clear, smooth boundary.

IIC1—46 to 56 inches, light brownish-gray (10YR 6/2) gravelly loam; many, medium, faint, gray (10YR 5/1) mottles and common, medium, distinct, strong-brown (7.5YR 5/8) mottles; massive; friable; 20 percent gravel; medium acid; clear, smooth boundary.

IIIC2—56 to 68 inches, grayish-brown (10YR 5/2) silt loam; common, fine, distinct, olive-brown (2.5Y 4/4) mottles and few, fine, faint, gray (10YR 6/1) mottles; massive; firm; 1 percent gravel; mildly alkaline; strong effervescence; clear, smooth boundary.

IVC3—68 to 78 inches, grayish-brown (10YR 5/2) gravelly sandy clay loam; moderate, medium, faint, gray (10YR 5/1) mottles and common, fine, distinct, olive-brown (2.5Y 4/4) mottles; massive; 20 percent gravel; mildly alkaline; strong effervescence.

The solum ranges from 30 to 50 inches in thickness. The Ap horizon ranges from black (10YR 2/1) to very dark grayish brown (10YR 3/2). The Btg horizon is sandy loam, loam, sandy clay loam, or clay loam. It is 2 to 20 percent gravel. It is neutral or has hue of 10YR, 2.5Y, or 5Y; value of 4 to 6, and chroma of 0 to 2. It is strongly acid to neutral. The C horizon is typically stratified with thin layers of loamy sand to clay loam and gravelly analogs of these.

Olmsted soils are most commonly adjacent to somewhat poorly drained Jimtown soils and well-drained Chili soils. They have a thicker, darker colored A horizon than these soils. In some places Olmsted soils are adjacent to the organic Carlisle and Linwood soils.

Od—Olmsted loam. This nearly level soil is in slight depressions on outwash terraces. Most areas of this soil range from 5 to 20 acres in size and are variable in shape.

Included with this soil in mapping are small areas of Luray and Linwood soils. In some areas the surface layer is either silt loam or light silty clay loam. A few areas have glacial till at depths as shallow as 5 feet.

This soil is easy to till and is suited to most crops if the soil is drained. Runoff is slow, and ponding is

common in winter and spring. Wetness is the major limitation to the use of this soil. Capability unit IIw–5; woodland suitability group 2w1.

Orrville Series

The Orrville series consists of nearly level, somewhat poorly drained soils. These soils formed in alluvium. They are on bottom lands throughout the county.

In a representative profile the surface layer is dark grayish-brown silt loam about 10 inches thick. Below this, to a depth of 28 inches, is mottled, yellowish-brown and grayish-brown, friable silt loam. The underlying material, between depths of 28 and 60 inches, is layers of sandy loam, and silty clay loam that are mainly yellowish brown but have grayish-brown mottles.

Orrville soils have moderate permeability. The available water capacity is high. These soils have a deep rooting zone in drained areas. They are susceptible to flooding. Except in drained areas, an apparent water table is near the surface in winter and spring. Runoff is very slow.

Only a few areas of these soils are cultivated because they lack adequate drainage and flood protection. The potential productivity is high.

Representative profile of Orrville silt loam in a pasture in Liverpool Township, 1,500 feet south of Grafton Road and State Route 252 junction, 150 feet west of State Route 252:

Ap—0 to 10 inches, dark grayish-brown (10YR 4/2) silt loam; moderate, medium, granular structure; friable; many roots; neutral; abrupt, smooth boundary.

B1g—10 to 16 inches, yellowish-brown (10YR 5/4) silt loam; many, fine and medium, distinct, grayish-brown (10YR 5/2) mottles; weak, medium, subangular blocky structure; friable; few fine roots; few, fine, black (10YR 2/1) concretions; slightly acid; clear, smooth boundary.

B2g—16 to 28 inches, grayish-brown (10YR 5/2) silt loam; many, medium, distinct, yellowish-brown (10YR 5/6) mottles; weak, coarse, subangular blocky structure; friable; few fine roots; thin, continuous, light brownish-gray (10YR 6/2) coatings on ped surfaces; few, fine, black (10YR 2/1) concretions; medium acid; clear, wavy boundary.

C1g—28 to 36 inches, grayish-brown (10YR 5/2) sandy loam; many, fine and medium, distinct, yellowish-brown (10YR 5/4) mottles; massive; friable; many, fine and medium, black (10YR 2/1) stains; slightly acid; clear, smooth boundary.

C2—36 to 42 inches, yellowish-brown (10YR 5/4) clay loam; many, fine, distinct, grayish-brown (10YR 5/2) mottles; massive; fine; medium black (10YR 2/1) stains; slightly acid; clear, smooth boundary.

C3—42 to 60 inches, yellowish-brown (10YR 5/6) silty clay loam; many, medium, distinct, grayish-brown (10YR 5/2) mottles; massive; firm; few, fine black (10YR 2/1) stains; slightly acid.

The A1 or Ap horizon ranges from 6 to 10 inches in thickness. This horizon is dark grayish brown (10YR 4/2) or very dark grayish brown (10YR 3/2) when unrubbed and dark grayish brown (10YR 4/2 or 2.5Y 4/2) when rubbed. The B horizon is mainly silt loam and loam, but thin stratified layers of sandy loam, clay loam, or light silty clay loam are in some profiles. It has hue of 2.5Y or 10YR, value of 5 or 6, and chroma of 1 to 4. Reaction in the solum, unless limed, ranges from strongly acid to slightly acid but is more commonly medium acid to slightly acid. The C horizon is massive. It is stratified silt loam, loam, silty clay loam, clay loam, and sandy loam. In some places gravelly and stony layers are below a depth of 40 inches.

Orrville soils are generally adjacent to moderately well drained Lobdell soils and well drained Chagrin soils. They typically are between areas of these soils and the adjacent soils on uplands or terraces. Orrville soils in places are adjacent to poorly drained Holly and Wallkill soils. They lack the organic underlying layers present in Wallkill soils.

Or—Orrville silt loam. This nearly level soil is in narrow stream valleys. It also is in long narrow strips along larger streams and commonly is adjacent to uplands. This soil receives runoff and seepage water from the upland slopes. Areas of this soil are commonly less than 50 acres in size. This soil has the profile described as representative of the series.

Included with this soil in mapping are small areas of the wetter Holly soils, especially in slight depressions. Small included areas of the better drained Lobdell and Chagrin soils are along the larger streams. These better drained soils are generally nearer the stream channel. Also included are some small areas of soils that have a sandy and gravelly surface layer. Small areas where shale bedrock underlies this soil at a depth of about 30 inches are along some of the narrow streams.

This soil is not susceptible to erosion, but flooding and subsequent wetness are limitations for its use. In places establishing suitable drainage outlets on this soil is difficult. Flooding and wetness are limitations for many nonfarm uses. Capability unit IIw–1; woodland suitability group 2w3.

Os—Orrville silt loam, bedrock substratum. This nearly level soil is in narrow stream valleys. It is underlain by bedrock at a depth of 40 to 60 inches. In most places the bedrock is exposed in the stream channel. This soil contains a higher percentage of coarse fragments than the soil described as representative of the series. Most areas are elongated, and they range from 5 to 40 acres in size.

Included with this soil in mapping are some areas of soils that are well drained or moderately well drained. These better drained soils are mainly along U.S. Highway 224, west of Lodi. There are some areas of soils that have shale and sandstone fragments on the surface and throughout the profile. Also included are spots of soils that have a more sandy and gravelly surface layer and some small areas of soils that have bedrock within a depth of 40 inches.

Flooding and wetness are the major limitations to the use of this soil for farming. These hazards and depth to bedrock are limitations for many nonfarm uses. Capability unit IIw–1; woodland suitability group 2w3.

Oshtemo Series

The Oshtemo series consists of gently sloping, well-drained soils. These soils formed in outwash material. They are on outwash terraces mainly in an area south of Seville.

In a representative profile the plow layer is dark grayish-brown sandy loam 9 inches thick. The subsoil extends to a depth of 65 inches. The upper 24 inches is dark-brown, friable sandy loam. The lower 32 inches is dark-brown gravelly sandy clay loam and gravelly

sandy loam. The underlying material, to a depth of 79 inches, is dark grayish-brown gravelly loamy sand.

Oshtemo soils have moderately rapid permeability. These soils warm up and dry out early in spring and are droughty during periods of limited rainfall. The available water capacity is low. The deep rooting zone is medium acid to very strongly acid unless limed.

These soils are used mainly for field crops. If irrigated, they are excellent for the production of vegetables and other specialized crops. The potential productivity is moderate.

Representative profile of Oshtemo sandy loam, 2 to 6 percent slopes, in a cultivated field in Guilford Township, about 1.25 miles south of Seville, about 900 feet east of Bell Road and Sterling Road junction, and about 150 feet south of Bell Road:

Ap—0 to 9 inches, dark grayish-brown (10YR 4/2) sandy loam; moderate, medium, granular structure; friable; 1 percent coarse fragments; slightly acid; abrupt, smooth boundary.

B1—9 to 18 inches, dark-brown (7.5YR 4/2) sandy loam; weak, medium, subangular blocky structure; friable; 1 percent coarse fragments; medium acid; clear, smooth boundary.

B21—18 to 33 inches, dark-brown (7.5YR 4/4) coarse sandy loam; weak, medium, subangular blocky structure; friable; very patchy, brown (7.5YR 4/4) clay bridging; 1 percent coarse fragments; very strongly acid; clear, smooth boundary.

IIB22t—33 to 47 inches, dark-brown (7.5YR 4/4) gravelly sandy clay loam; massive; very friable; thin, continuous, brown (7.5YR 4/4) clay bridging; 20 percent coarse fragments; very strongly acid; clear, smooth boundary.

IIB31t—47 to 59 inches, dark brown (7.5YR 4/4) gravelly sandy loam; massive; very friable; brown (7.5YR 4/4) clay bridging; 25 percent coarse fragments; very strongly acid; clear, smooth boundary.

IIB32t—59 to 65 inches, dark-brown (10YR 4/3) gravelly sandy clay loam; massive; very friable; thin, very patchy clay bridging; 30 percent coarse fragments; medium acid; clear, wavy boundary.

IIIC—65 to 79 inches, dark grayish-brown (2.5Y 4/2) gravelly loamy sand; single grained; 30 percent coarse fragments; neutral.

The solum ranges from 40 to 66 inches in thickness. It is very strongly acid to medium acid. Content of gravel ranges from less than 1 percent to about 30 percent. The Ap horizon is dark grayish brown (10YR 4/2) and dark brown (10YR 4/3). In undisturbed areas, there is a very dark grayish-brown (10YR 3/2) A1 horizon 1 to 4 inches thick. The A2 horizon, if present, is brown (10YR 5/3) or yellowish brown (10YR 5/4) and is 2 to 6 inches thick. A B1 horizon is present in most profiles. The Bt horizon has hue of 7.5YR and 10YR, value of 4 or 5, and chroma of 3 or 4. It is sandy loam, gravelly sandy loam, and gravelly sandy clay loam.

Oshtemo soils are commonly near the Sebring, Fitchville, Bogart, and Haskins soils. The Oshtemo soils are more sandy and better drained than Sebring, Fitchville, and Haskins. Also, they lack the clayey lower part of the B horizon common to Haskins soils. They are better drained and less gravelly than the Bogart soils. They have less clay and gravel in the upper part of the B horizon than the nearby Chili soils.

OtB—Oshtemo sandy loam, 2 to 6 percent slopes. This gently sloping soil is on sandy terraces. It is irregular in shape, and areas are less than 30 acres in size.

Included with this soil in mapping are a few spots that are underlain by clayey material at a depth of about 6 feet.

Runoff is slow, but the hazard of erosion is moderate if this soil is used for cultivated crops. This soil is droughty in summer unless rainfall is timely. Droughtiness and slope are limitations of this soil for some nonfarm uses. Capability unit IIIs–1; woodland suitability group 3s1.

Ravenna Series

The Ravenna series consists of nearly level to gently sloping, somewhat poorly drained soils. These soils formed in loam or silt loam glacial till. They are on uplands in the southeastern and eastern parts of the county.

In a representative profile in a meadow, the plow layer is a dark grayish-brown silt loam 9 inches thick. The subsurface layer is 3 inches of mottled, light yellowish-brown, friable silt loam. The subsoil extends to a depth of 57 inches. The upper 4 inches is mottled, yellowish-brown, firm silt loam; the next 14 inches is mottled, dark yellowish-brown, firm loam; and the lower part is a fragipan of mottled, dark yellowish-brown, very firm loam. Below the fragipan, to a depth of 68 inches, the underlying material is brown, very firm loam.

The Ravenna soils have moderate permeability above the fragipan and slow permeability in the fragipan and in the underlying glacial till. The available water capacity is moderate. These soils have a perched water table above the fragipan late in winter and in spring. They are medium acid to very strongly acid above the fragipan and have a moderately deep rooting zone.

In Medina County about two-thirds of the acreage of Ravenna soils is in field crops. Artificial drainage of these soils is beneficial to these crops. The soils have moderate potential productivity.

Representative profile of Ravenna silt loam, 0 to 2 percent slopes, in a meadow in Sharon Township, 2,400 feet east of Ridge Road and Ridgewood Road junction and 1,200 feet south of Ridgewood Road:

Ap—0 to 9 inches, dark grayish-brown (10YR 4/2) silt loam; moderate, medium, granular structure; friable; many roots; medium acid; abrupt, smooth boundary.

A2—9 to 12 inches, light yellowish-brown (10YR 6/4) silt loam; common, fine, distinct, light brownish-gray (10YR 6/2) and yellowish-brown (10YR 5/6) mottles; weak, medium, subangular blocky structure; friable; common roots; strongly acid; clear, smooth boundary.

B21t—12 to 16 inches, yellowish-brown (10YR 5/6) heavy silt loam; many, medium, distinct, light brownish-gray (10YR 6/2) mottles and common, fine, distinct, brown (10YR 5/3) mottles; moderate; medium, subangular blocky structure; firm; common roots; thin, very patchy clay films on ped surfaces; 2 percent pebbles; strongly acid; clear, smooth boundary.

IIB22tg—16 to 23 inches, dark yellowish-brown (10YR 4/4) loam; common, fine, distinct, light brownish-gray (10YR 6/2) mottles; weak, medium, prismatic structure parting to moderate, medium, subangular blocky; firm; few roots; thin, continuous, gray (10YR 6/1) silty coatings on vertical prism surfaces and a thin rind of yellowish brown (10YR 5/8); thin, patchy clay films on prism surfaces; common, fine, dark stains and concretions; 5 percent pebbles; strongly acid; clear, wavy boundary.

IIB23tg—23 to 30 inches, dark yellowish-brown (10YR

4/4) loam; common, fine, distinct, light brownish-gray (10YR 6/2) mottles; moderate, coarse, prismatic structure parting to weak, coarse, subangular blocky; firm (25 percent of the mass is brittle); few roots; medium, continuous, gray (10YR 6/1) coatings on vertical ped surfaces and a thin rind of yellowish-brown (10YR 5/8) between the coating and prism interiors; common, fine, dark stains and concretions; 5 percent pebbles; strongly acid; clear, wavy boundary.

IIBx—30 to 57 inches, dark yellowish-brown (10YR 4/4) loam; common, medium, distinct, gray (10YR 6/1) and yellowish-brown (10YR 5/4) mottles; weak, very coarse, prismatic structure parting to weak, thick, platy; very firm; brittle; few roots on prism surfaces; medium, continuous, gray (N 5/0) coatings on vertical prism surfaces and distinct, black (10YR 2/1) stains and concretions; 5 percent pebbles; medium acid; gradual, wavy boundary.

IIC—57 to 68 inches, brown (10YR 4/3) loam; massive; very firm; few, thick, gray (10YR 6/1) streaks and a thin rind of yellowish brown (10YR 5/8); 10 percent pebbles; slightly acid.

The solum ranges from 46 to 75 inches in thickness. Typically, the Ap horizon is dark grayish brown (10YR 4/2), but it ranges from dark gray (10YR 4/1) to dark brown (10YR 4/3). In undisturbed areas the A1 horizon is very dark gray (10YR 3/1) or very dark grayish brown (10YR 3/2) and is 2 to 4 inches thick. The A2 horizon is pale brown (10YR 6/3) or light yellowish brown (10YR 6/4), is mottled, and is 2 to 8 inches thick. A B1 horizon is present in some profiles. In other profiles a B&A or A&B horizon is present. The part of the Bt horizon above the fragipan is mainly silt loam and loam but in places it includes thin layers of light clay loam. The matrix colors include hue of 7.5YR to 5Y, value of 4 or 5, and chroma of 2 to 6. The top of the fragipan is at a depth of 26 to 32 inches. Dominant chroma of the prism interiors is typically 4 and value is 3 or 4. Texture is loam, silt loam, or light silty clay loam. Reaction in the upper part of the solum ranges from very strongly acid to medium acid unless limed, and it generally increases in the lower part of the solum and in the substratum. Coarse fragments make up 2 to 10 percent of the Bt and Bx horizons. The C horizon is loam or silt loam.

Ravenna soils are the somewhat poorly drained member of a drainage sequence that includes well drained Wooster soils and moderately well drained Canfield soils. They are commonly adjacent to these soils.

ReA—Ravenna silt loam, 0 to 2 percent slopes. This nearly level soil is on upland flats and typically is in shallow drainageways. Areas of this soil are irregular in shape and variable in size. This soil has the profile described as representative of the series.

Included with this soil in mapping are small areas of soils that have a thicker, darker colored surface layer than this Ravenna soil. Also included are a few spots of Sebring silt loam, till substratum. In some areas bedrock is beneath the Ravenna soils at a depth of about 4 to 8 feet.

Seasonal wetness is the major limitation to the use of this soil for farming. Also, the fragipan limits rooting depth. Runoff is slow on this soil, and in places water is ponded on the surface. The surface layer is susceptible to crusting. Seasonal wetness and slow permeability are limitations for many nonfarm uses. Capability unit IIw-3; woodland suitability group 2w4.

ReB—Ravenna silt loam, 2 to 6 percent slopes. This gently sloping soil is in areas at the heads of drainageways and on base slopes along drainageways. These areas are mainly irregular in shape and less than 20 acres in size. This soil is also on broad uplands where the slope is mainly uniform and long. These upland areas range as large as 100 acres.

Included with this soil in mapping are small knolls of the better drained Canfield soils. Also included are a few spots of eroded soils. On long slopes there is lateral movement of water downslope on top of the fragipan. This causes downslope seeps in periods of heavy rainfall. These seep spots, along with other included small depressional areas, have a grayer subsoil than that in this Ravenna soil. Also included are small areas of soils that have bedrock at a depth of 5 feet.

Seasonal wetness is a moderate limitation to use of this soil for cultivated crops. Runoff is medium, and erosion is a hazard. The fragipan restricts deep root development for crops such as alfalfa, and the surface layer is susceptible to crusting. Seasonal wetness, slope, and slow permeability are limitations for many nonfarm uses. Capability unit IIw-3; woodland suitability group 2w4.

RnA—Ravenna-Urban land complex, nearly level. This complex is dominant within the city of Wadsworth. It is mainly level, but some gently sloping areas are included in mapping. Much of the natural soil has been destroyed or covered as the result of grading and digging. The complex now includes areas of relatively undisturbed Ravenna soils, areas that are covered by buildings, street, and driveways, and areas of cut and fill land.

The relatively undisturbed Ravenna soils make up about one-third of the total area in the mapping unit. They are in undeveloped lots and parts of developed lots. A Ravenna soil in this complex has a profile similar to the one described as representative of the Ravenna series, but in places the natural surface layer is covered with less than 1 foot of fill material. It is more difficult to establish and maintain good lawns in the areas that have the thin cover of fill material than it is where the natural surface layer is exposed. This is because of the lower organic-matter content and the less favorable physical condition of the fill material. This thin layer of fill material does not have an adverse effect on trees and shrubs, because their roots extend into the underlying natural surface layer.

About one-third of the mapping unit is covered by buildings, streets, driveways, and parking lots. This is the urban land part of the complex.

The remaining one-third of the mapping unit consists of cut and fill land, of which the fill land part is dominant. The fill areas are characterized by having 1 foot to 3 feet of fill material overlying Ravenna soils. Typically, the fill material originates onsite and is from building and street excavations. Commonly the thicker layers of fill are near the buildings. This fill material is mainly Ravenna subsoil and substratum material. The cut land areas are characterized by exposed subsoil or glacial till material typical of the Ravenna soils. These areas are commonly adjacent to streets, where cuts were made into the landscape. Other areas consist of knolls that were reshaped and of the banks of excavated areas.

The surface layer of the cut and fill land areas is low in organic-matter content. Also, the physical properties are poor. Landscaping is very difficult in the cut land areas that have the dense fragipan or glacial

till exposed at or near the surface. Adding topsoil to these areas is beneficial.

The hazard of erosion ranges from slight to moderate during the construction period when these soils are bare of vegetation. Wetness, high potential frost action, and some included spots where bedrock is within a depth of 5 feet are limitations for many nonfarm uses. Not assigned to a capability unit or a woodland suitability group.

Rawson Series

The Rawson series consists of gently sloping, moderately well drained soils. These soils formed partly in loamy material 24 to 40 inches in thickness and partly in the underlying, finer textured, calcareous till or lacustrine material. They are mainly on rather broad terraces along the East Branch of Black River, but small scattered areas are in Brunswick and Hinckley Townships.

In a representative profile in a meadow, the plow layer is dark grayish-brown loam 8 inches thick. The subsoil extends to a depth of 36 inches. The upper 15 inches is yellowish-brown, friable and firm loam; the next 7 inches is mottled, reddish-brown, firm sandy clay loam; and the lower part is mottled, dark yellowish-brown, very firm silty clay. The underlying material, between depths of 36 and 60 inches, is mottled, brown, very firm silty clay.

Rawson soils have moderate permeability in the loamy upper part of the subsoil and very slow permeability in the clayey lower part of the subsoil and in the material. The available water capacity is moderate. These soils have a temporary water table for short periods in winter and spring. They have a moderately deep rooting zone that is acid in the upper part unless limed.

These soils are not extensive in the county. Their use for farming commonly depends on the use being made of the surrounding soils. They are suited to most locally grown crops. Tilth is good, and the potential productivity is moderate.

Representative profile of Rawson loam, 2 to 6 percent slopes, in a meadow in Spencer Township, about 3,200 feet north of River Corners; 1,700 feet east of River Corners Road and 800 feet north of the Spencer Wildlife Lake service road (west entrance):

Ap—0 to 8 inches, dark grayish-brown (10YR 4/2) loam; moderate, fine and medium, granular structure; friable; many roots; 5 percent pebbles; slightly acid; abrupt, smooth boundary.

B1—8 to 11 inches, yellowish-brown (10YR 5/4) loam; weak, fine, subangular blocky structure; friable; common roots; thin, continuous, brown (10YR 5/3) coatings on ped surfaces; 8 percent pebbles; medium acid; clear, wavy boundary.

B21t—11 to 23 inches, yellowish-brown (10YR 5/4) loam; moderate, medium, subangular blocky structure; firm; common roots; thin, patchy, brown (10YR 5/3) coatings on ped surfaces; thin, very patchy clay films; 10 percent pebbles; medium acid; clear, wavy boundary.

B22t—23 to 30 inches, reddish-brown (5YR 4/3) sandy clay loam; few, fine, prominent, grayish-brown (2.5YR 5/2) mottles and common, fine, distinct, strong-brown (7.5YR 5/6) mottles; moderate, medium, subangular blocky structure; firm; few roots; thin, patchy clay films on ped surfaces and clay bridging of sand grains; few, fine, black (10YR 2/1) stains; 5 percent pebbles; slightly acid; clear, wavy boundary.

IIB3t—30 to 36 inches, dark yellowish-brown (10YR 4/4) silty clay; common, fine, distinct, grayish-brown (2.5Y 5/2) and yellowish-brown (10YR 5/6) mottles; weak, coarse, prismatic structure parting to moderate, medium, angular blocky; very firm; few roots; thin, patchy clay films on ped surfaces; 2 percent pebbles; mildly alkaline; clear, wavy boundary.

IIC—36 to 60 inches, brown (10YR 5/3) silty clay; common, fine, distinct, gray (10YR 5/1) mottles and few, fine, distinct, yellowish-brown (10YR 5/6) mottles; massive; very firm; mildly alkaline.

The solum ranges from 26 to 40 inches in thickness and typically extends into the underlying fine-textured material. It is neutral to strongly acid in the upper part and is commonly dark grayish brown (10YR 4/2), but in places it is dark brown (10YR 4/3) and brown (10YR 5/3).

The B horizon has hue of 10YR or 7.5YR, and in places it has a thin layer that has hue of 5YR, value of 4 or 5, and chroma of 3 to 6. It is loam, sandy clay loam, clay loam, and gravelly analogs of these textures. The IIB horizon ranges from dark yellowish brown to gray. It is clay, silty clay, silty clay loam, and heavy clay loam. The IIC horizon is calcareous and is of glacial till or lacustrine origin. It is commonly silty clay and heavy silty clay loam; but in some places there are thin layers of light silty clay loam and silt loam. Reaction is slightly acid to mildly alkaline.

Rawson soils have a brighter colored B horizon and are deeper to mottling than the nearby Haskins soils. They are coarser textured in the upper part of the B horizon than the nearby Geeburg soils.

RoB—Rawson loam, 2 to 6 percent slopes. This gently sloping soil is in oblong to irregularly shaped areas on outwash terraces. Most areas are less than 20 acres in size, and they are mainly along the East Branch of Black River.

Included with this soil in mapping are small areas of the somewhat poorly drained Haskins soils, which are on the lower lying areas or depressional areas where surface water accumulates. Also included are a few areas of nearly level soils in Brunswick and Hinckley townships.

Most areas of this soil are within cropped fields and are managed with areas of surrounding soils. However, because of better surface drainage, this soil warms up sooner and can be cultivated in spring before most adjacent soils. The hazard of erosion is slight to moderate. The very slow permeability of the lower part of the subsoil and the underlying material are limitations for some nonfarm uses. Capability unit IIe–1; woodland suitability group 2o1.

Rittman Series

The Rittman series consists of gently sloping to very steep, moderately well drained soils. These soils mostly formed in silty clay loam or clay loam glacial till. They are on uplands in the southern and east-central parts of the county.

In a representative profile the plow layer is brown silt loam 8 inches thick. The subsoil extends to a depth of 48 inches. The upper 13 inches is yellowish-brown, firm silt loam and silty clay loam that is mottled in the lower part. The next 5 inches is mottled, dark yellowish-brown, firm clay loam. The next 14 inches is a fragipan of mottled, dark yellowish-brown, very firm and brittle clay loam. The lower part of the sub-

soil and the underlying material, between depths of 40 and 60 inches, are dark yellowish-brown clay loam.

Rittman soils have slow permeability in the fragipan and in the underlying glacial till. The available water capacity is moderate. The water table is high in winter and in spring. This water table is perched above the fragipan.

These soils have a moderately rooting zone that is restricted by the fragipan. It is strongly acid or very strongly acid, except where influenced by liming.

Most areas of Rittman soils are farmed. Some were never cleared and are in woodland. Others were cleared but have since reverted to young trees and other natural vegetation. When these soils are cultivated, the main crops are grass-legume meadow, wheat, and corn. Some areas are pastured. These soils have moderate potential productivity.

Representative profile of Rittman silt loam, 6 to 12 percent slopes, moderately eroded, in a pasture in Montville Township, northwest of Boneta, about 0.9 mile east of State Route 162 and River Styx Road junction, and about 570 feet east of State Route 162:

Ap—0 to 8 inches, brown (10YR 4/3) silt loam mixed with about 35 percent yellowish-brown (10YR 5/6) subsoil; moderate, medium, granular structure; friable; many roots; 5 percent coarse fragments; medium acid; abrupt, smooth boundary.

B1—8 to 10 inches, yellowish-brown (10YR 5/6) heavy silt loam; weak, fine, subangular blocky structure; firm; common roots; 2 percent coarse fragments; strongly acid; clear, smooth boundary.

B21t—10 to 16 inches, yellowish-brown (10YR 5/6) silty clay loam; moderate, medium, subangular blocky structure; firm; common roots; thin, continuous, brown (10YR 5/3) coatings; thin, very patchy clay films; 2 percent coarse fragments; very strongly acid; clear, smooth boundary.

B22t—16 to 21 inches, yellowish-brown (10YR 5/4) silty clay loam; common, medium, distinct, grayish-brown (10YR 5/2) mottles; moderate, coarse, subangular blocky structure; firm; few roots; thin, continuous, brown (10YR 5/3) coatings; thin, patchy clay films; 2 percent coarse fragments; very strongly acid; clear, smooth boundary.

B23t—21 to 26 inches, dark yellowish-brown (10YR 4/4) clay loam; common, fine, distinct, yellowish-brown (10YR 5/6) mottles; moderate, coarse, prismatic structure parting to moderate, coarse, subangular blocky; firm, about 20 percent of mass is brittle: few roots along seams; thin, continuous light brownish-gray (10YR 6/2) coatings; gray (N 5/0) clay seams; thin, patchy clay films; 5 percent coarse fragments; very strongly acid; clear, smooth boundary.

Bx—26 to 40 inches, dark yellowish-brown (10YR 4/4) clay loam; common, fine, distinct, yellowish-brown (10YR 5/6) mottles; moderate, very coarse, prismatic structure parting to weak, thick platy; very firm; 75 percent of mass is brittle; few roots along seams; thick, continuous, light brownish-gray (10YR 6/2) coatings; gray (N 5/0) clay seams; medium, patchy clay films; 5 percent coarse fragments; strongly acid; clear, smooth boundary.

B3—40 to 48 inches, dark yellowish-brown (10YR 4/4) clay loam; weak, thick, platy structure; firm, slight brittleness; light brownish-gray (10YR 6/2) streaks and seams; 10 percent coarse fragments; neutral; gradual, wavy boundary.

C—48 to 60 inches, dark yellowish-brown (10YR 4/4) clay loam; massive; light brownish-gray (10YR 6/2) streaks and seams; 10 percent coarse fragments; mildly alkaline; strong effervescence.

The solum ranges from 34 to 58 inches in thickness. The Ap horizon ranges from dark grayish brown (10YR 4/2) to brown (10YR 5/3). In undisturbed areas the A1 horizon generally is 1 inch to 3 inches thick and is very dark grayish brown (10YR 3/2), and the A2 horizon is 4 to 7 inches thick and is brown (10YR 5/3) or yellowish brown (10YR 5/4). The part of the B2t horizon above the fragipan is clay loam or silty clay loam. It has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 to 6. The top of the fragipan is at a depth of 20 to 32 inches. The fragipan ranges from 10 to 25 inches in thickness. Reaction is typically very strongly or strongly acid above the fragipan, unless limed, and becomes less acid with increasing depth. The fragipan is dark brown (10YR 4/3) or dark yellowish brown (10YR 4/4). It is heavy loam, silt loam, light clay loam, or silty clay loam. Depth to calcareous material ranges from 40 to 60 inches. The C horizon is loam, silt loam, clay loam, or silty clay loam. Coarse fragments, which are as large as 3 inches in diameter and are 5 to 15 percent by volume, are common in the C horizon.

Rittman soils are the moderately well drained member of a drainage sequence that includes the somewhat poorly drained Wadsworth soils. They are also adjacent to Loudonville soils. Rittman soils differ from Loudonville soils by not having bedrock within 20 to 40 inches of the surface. Also Rittman soils have a fragipan, which is lacking in Loudonville soils. Rittman soils are more clayey than Canfield soils, which are otherwise similar.

RsB—Rittman silt loam, 2 to 6 percent slopes. This gently sloping soil is on knolls and side slopes along drainageways. Most areas of this soil are somewhat oblong in shape and less than 15 acres in size. Many of these areas are wooded or in permanent pasture. This soil is only slightly eroded, the surface layer is slightly thicker in most places and is slightly higher in organic-matter content. Depth to the fragipan is greater than in the profile described as representative of the series.

Included with this soil in mapping, on the upper part of side slopes, are areas of moderately eroded soils that have a lighter colored surface layer. Also included are small areas of the somewhat poorly drained Wadsworth soils. These wetter soils are in depressional areas that accumulate surface water. They also occur as seep spots on long side slopes.

This soil has a perched water table late in winter and early in spring. Because runoff is medium, the hazard of erosion is moderate on this soil if it is used for cultivated crops. Surface crusting is a hazard in cultivated areas. Slow permeability and seasonal wetness are limitations for many nonfarm uses. Capability unit IIe–3; woodland suitability group 1o1.

RsB2—Rittman silt loam, 2 to 6 percent slopes, moderately eroded. This gently sloping soil is on knolls and side slopes along drainageways. Most areas of this soil are irregular in shape. Typically, they are less than 25 acres in size. The original surface layer of this soil is eroded. The plow layer is a mixture of the original surface layer and material from the upper part of the subsoil. Depth to the fragipan is commonly less than 27 inches, and gray mottles are within 10 to 20 inches of the surface.

Included with this soil in mapping are small areas of the adjacent Wadsworth soils. These included areas are on lower parts of side slopes and in small depressions. Also included are a few spots of less eroded soils that have a slightly darker and thicker surface layer than this Rittman soil.

Runoff is medium. Erosion is a moderate limitation to the use of this soil for cultivated crops. The plow

layer has medium to low organic-matter content. As a result, the range of moisture content within which this soil can be satisfactorily tilled is narrower than for the less eroded Rittman soils. Slow permeability and seasonal wetness are limitations for many nonfarm uses. Capability unit IIe-3; woodland suitability group 1o1.

RsC—Rittman silt loam, 6 to 12 percent slopes. This sloping soil is in elongated strips, 5 to 20 acres in size, that have short slopes. It is mainly wooded. Typically it receives little runoff from the surrounding area, and there has not been any excessive sheet erosion.

Included with this soil in mapping are small areas of somewhat poorly drained Wadsworth soils. These wetter soils are at the heads of and adjacent to drainageways where seep spots occur. Also included are a few spots of eroded soils.

Runoff is rapid. The hazard of erosion is severe, and surface crusting is a concern if this soil is cultivated. Slow permeability, seasonal wetness, and slope are limitations for many nonfarm uses. Capability unit IIIe-1; woodland suitability group 1o1.

RsC2—Rittman silt loam, 6 to 12 percent slopes, moderately eroded. This sloping soil is on long hillside slopes and on the shorter side slopes along drainageways. The areas are as much as 300 acres in size. This soil has the profile described as representative of the series. The surface layer of this soil is a mixture of material from the original surface layer and subsoil.

Included with this soil in mapping are a few spots of severely eroded soils that typically have shallow gullies. Coarse fragments as large as 5 inches in diameter are common in the surface layer of these soils. Also included are small localized wet spots, particularly along the shallow drainageways.

A severe hazard of erosion is the major limitation to the use of this soil for farming. Runoff is rapid and surface crusting can be a concern if this soil is cultivated. Slow permeability, slope, seasonal wetness, and the hazard of erosion are limitations for many nonfarm uses. Capability unit IIIe-1; woodland suitability group 1o1.

RsE2—Rittman silt loam, 12 to 25 percent slopes, moderately eroded. This moderately steep to steep soil is on irregularly shaped hillsides that commonly have shallow drainageways and draws. Most of the nonwooded areas of this soil have lost half or more of the original surface layer through erosion. In a few areas the surface layer is mostly yellowish-brown material from the subsoil. In these areas the fragipan is nearer the surface than in the profile described as representative of the series.

Included with this soil in mapping are some areas that are mainly slightly eroded soils. These soils are in woodland.

Runoff is rapid and the hazard of erosion is severe if this soil is cultivated. Slope, slow permeability, and the hazard of erosion are limitations for most nonfarm uses. Capability unit IVe-3; woodland suitability group 1r1.

RsF—Rittman silt loam, 25 to 70 percent slopes. This very steep soil is on hillsides, many of which are the side slopes of V-shaped valleys formed by deeply entrenched drainageways. Typically the slopes are short. Most areas are narrow and long, and they range from 5 to more than 30 acres in size. The thickness of the surface layer and subsoil is less than that of the profile that is described as representative of the series. Also, the fragipan is not so pronounced.

Included with this soil in mapping are some areas of well-drained soils. Also included are areas of slightly eroded soils, mostly in woodland.

Runoff is very rapid. The hazard of erosion is severe unless plant cover is maintained. Slope is the dominant limitation for most nonfarm uses. Capability unit VIIe-2; woodland suitability group 1r2.

Schaffenaker Series

The Schaffenaker series consists of very steep, well-drained soils. These soils formed in sandy residuum weathered from acid sandstone. Depth to bedrock ranges from 20 to 40 inches. These soils are in narrow, elongated areas where sandstone ledges outcrop. They are mainly in the eastern and northern parts of the county.

In a representative profile in a wooded area, the surface layer is very dark brown loamy sand 2 inches thick. The subsoil extends to a depth of 38 inches. The upper 4 inches is dark-brown, very friable loamy sand. The rest is brown and yellowish-brown, very friable loamy sand that is flaggy. Sandstone bedrock is at a depth of 38 inches.

These Schaffenaker soils have very rapid permeability. They have a moderately deep rooting zone that is acid. The available water capacity is very low.

Most areas of these soils are in woodland. The very steep slopes and sandstone ledges largely preclude other uses.

Representative profile of Schaffenaker loamy sand, 25 to 70 percent slopes, in a woods in Sharon Township, about 2,500 feet north of Sharon Center, and about 2,500 feet east of State Route 94:

A1—0 to 2 inches, very dark brown (10YR 2/2) loamy sand; weak, fine, granular structure; very friable; some uncoated sand grains; about 5 percent coarse fragments; very strongly acid; clear, wavy boundary.

B1—2 to 6 inches, dark-brown (7.5YR 4/4) loamy sand; weak, fine, granular structure; very friable; 5 to 10 percent coarse fragments; very strongly acid; clear, wavy boundary.

B21—6 to 10 inches, brown (7.5YR 4/4) flaggy loamy sand; weak, fine, subangular blocky structure; very friable; 25 percent coarse fragments; very strongly acid; gradual, wavy boundary.

B22—10 to 25 inches, brown (7.5YR 5/4) flaggy loamy sand; weak, fine, subangular blocky structure; very friable; 25 percent coarse fragments; very strongly acid; gradual, wavy boundary.

B3—25 to 38 inches; yellowish-brown (10YR 5/4) flaggy loamy sand; single grained; very friable; 50 percent coarse fragments; very strongly acid; abrupt, irregular boundary.

R—38 inches, sandstone bedrock.

Thickness of the solum and depth to bedrock range from 20 to 40 inches. Reaction ranges from extremely acid to strongly acid throughout. Content of coarse fragments in the solum mainly ranges from 0 to 30 percent, but some thin layers above the bedrock are as much as 60 percent coarse fragments.

The A1 horizon is 1 inch to 4 inches thick and is black (10YR 2/1), very dark brown (10YR 2/2), or very dark grayish brown (10YR 3/2). It ranges from loamy fine sand to sand. In some places a thin A2 horizon is present.

It has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. The B horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 3 to 6. It is loamy sand or flaggy loamy sand. A C horizon is present in some places. It is generally one or two units lower in value or chroma, or both, than the B horizon.

Schaffenaker soils are in positions on the landscape similar to those of the Berks soils. They differ from the Berks soils by having a much higher content of sand throughout the solum. Schaffenaker soils are commonly adjacent to Loudonville soils. They differ from Loudonville soils by having formed in sandy residuum rather than in glacial till, but depth to bedrock in both soils is similar.

ScF—Schaffenaker loamy sand, 25 to 70 percent slopes. Most areas of this soil are narrow and oblong in shape and are less than 30 acres in size. Uneven surfaces are common. Sandstone ledges commonly make up 20 to 50 percent of the unit. In some places large sandstone boulders have broken from the ledges and have sloughed downslope. These boulders commonly make up 5 to 10 percent of the surface area that lies just below the ledge. Springs are common. They are generally at the base of the ledge and commonly mark the beginning of a waterway.

Included with this soil in mapping are small areas of soils on the downslope side that are underlain by glacial till at a depth of about 3 feet. In these spots, the sandy colluvium has moved downslope and covered the glacial till. These soils have a higher content of clay in the subsoil than does this Schaffenaker soil. Also included are some areas of moderately eroded soils.

Runoff is rapid. Land use is limited mainly to woodland and wildlife habitat because of the very steep slopes, severe erosion potential, and the sandstone ledges and boulders. Capability unit VIIe–1; woodland suitability group 4r1.

Sebring Series

The Sebring series consists of nearly level, poorly drained soils. These soils formed in lacustrine sediment. They are on scattered glacial lakebeds surrounded by glacial till uplands and are on terraces along the major streams in the county.

In a representative profile in a pasture, the surface layer is very dark grayish-brown silt loam 5 inches thick. The subsurface layer is mottled, dark-gray silt loam 4 inches thick. The subsoil, extending to a depth of 45 inches, is mottled, gray, mostly firm silt loam. The underlying material, between depths of 45 and 75 inches, is mottled, light olive-brown silt loam.

These soils have moderately slow permeability. The available water capacity is high. These soils have a seasonal high water table that is perched. Where these soils are artificially drained, they have a deep rooting zone. The rooting zone is acid. Sebring soils are soft and compressible when saturated. They are subject to high potential frost action.

Most areas of Sebring soils have been cleared and are used for late summer pasture or are reverting to natural swamp-type vegetation. Because of the lack of adequate drainage, few areas are cultivated. Adequate drainage outlets are generally not available. The potential productivity is moderate to high.

Representative profile of Sebring silt loam, in Guilford Township, about 1 mile southeast of Seville, about 0.7 mile south of Seville Road and Lee Road junction, and about 1,300 feet west of Lee Road:

Ap1—0 to 5 inches, very dark grayish-brown (10YR 3/2) silt loam; strong, medium, granular structure; friable; many roots; 1 percent coarse fragments; strongly acid; abrupt, smooth boundary.

Ap2—5 to 9 inches, dark-gray (5Y 4/1) silt loam; many, fine, prominent, dark yellowish-brown (10YR 4/4) mottles; weak, medium, platy structure; friable; many roots; common, fine, dark concretions; 1 percent coarse fragments; strongly acid; abrupt, wavy boundary.

B1g—9 to 14 inches, gray (5Y 5/1) heavy silt loam; few, fine, distinct, light olive-brown (2.5Y 5/6) mottles; moderate, medium, subangular blocky structure; friable; few roots; gray (5Y 5/1) coatings on ped surfaces; few, fine, dark concretions; 1 percent coarse fragments; medium acid; clear, smooth boundary.

B21tg—14 to 25 inches, gray (5Y 5/1) heavy silt loam; common, fine, prominent, yellowish-brown (10YR 5/8) mottles; moderate, medium, subangular blocky structure; firm; few roots; thin, very patchy clay films on vertical surfaces of peds; few fine dark concretions; 1 percent coarse fragments; medium acid; clear, smooth boundary.

B22tg—25 to 45 inches, gray (5Y 5/1) heavy silt loam; few, fine, prominent, yellowish-brown (10YR 5/4) mottles; weak, coarse, subangular, blocky structure; firm; few roots; thin, very patchy clay films on ped surfaces and in fine pores; common, fine, dark concretions; medium acid; clear, wavy boundary.

Cg—45 to 75 inches, light olive-brown (2.5Y 5/6) silt loam; many, coarse, distinct, gray (5Y 6/1) mottles; massive; few, thick, gray (N 5/0) streaks along fracture channels; neutral.

Thickness of the solum ranges from 30 to 50 inches. In undisturbed areas a very dark grayish-brown (10YR 3/2) or very dark gray (10YR 3/1) A1 horizon 2 to 5 inches thick and a dark-gray (10YR 4/1), gray (5Y 5/1 or 10YR 6/1), or light brownish-gray (10YR 6/2) A2 horizon 3 to 8 inches thick are present. The Ap horizon is dark gray (5Y 4/1) to very dark grayish brown (10YR 3/2). In most profiles a thin B1, B&A, or A&B horizon is present. The B2t horizon has hue of 10YR to 5Y or N; value of 4 to 6; and chroma of 0 to 2. It is silt loam or silty clay loam that is very strongly acid to medium acid. The C horizon is typically stratified and has thin layers ranging from loamy sand to silty clay. In places it is clay loam, silty clay loam, loam, or silt loam. It has hue of 10YR to 5Y, value of 4 or 5, and chroma of 0 to 6.

Sebring soils are the poorly drained members of a drainage sequence that includes moderately well drained Glenford soils, somewhat poorly drained Fitchville soils, and very poorly drained Luray soils. They are commonly adjacent to Fitchville, Glenford, Canadice, Luray, Carlisle, Linwood, Wallkill, and Oshtemo soils. Sebring soils have grayer colors than Fitchville and Glenford soils. They lack the organic-matter content common to Carlisle and Linwood soils and to the lower layers of Wallkill soils, and their A horizon is not so dark as that of Luray soils. They have a lower clay content than Canadice soils. Sebring soils contain less sand than well-drained Oshtemo soils.

Sg—Sebring silt loam. This nearly level soil is in small depressional basins on uplands and in broad to narrow areas on low terraces. Most areas of this soil are 5 to 20 acres in size. This soil has the profile described as representative of the series.

Included with this soil in mapping are small areas of Luray and Fitchville soils. In some places the layers between depths of 15 and 36 inches are less gray or more loamy, or both, than those in this Sebring soil. A few included areas of soils have a surface layer of silty clay loam, and in places the surface layer is mucky. Also included are small depressional areas that

are underlain by glacial till at a depth of about 4 feet. These areas are on uplands, and they are adjacent to soils that formed in glacial till.

Excessive wetness is the major limitation to the use of this soil for farming. Ponding is common during the wet period, and some areas are susceptible to flooding from nearby streams. The surface layer is susceptible to crusting. Seasonal wetness, soft and compressible soil material, moderately slow permeability, and high potential frost action are limitations for most nonfarm uses. Capability unit IIIw–2; woodland suitability group 2w2.

St—Sebring silt loam, till substratum. This nearly level soil is in shallow, bowl-shaped depressions and concave areas in shallow drainageways. Most areas are less than 10 acres in size. These areas are on the glacial till plain. This soil has a profile similar to the one described as representative of the series, but it is underlain by glacial till at a depth of about 45 inches. The glacial till is compact and is 5 to 10 percent coarse fragments. It is commonly silty clay loam or clay loam, but in places it is loam or silt loam.

Included with this soil in mapping are small areas of soils that have a slightly thicker and darker colored surface layer than this Sebring soil.

Excessive wetness is the major limitation for most farm and nonfarm uses of this soil. The soil material above the glacial till underlying this soil has greater stability and strength for supporting loads than the underlying material of other Sebring soils. The glacial till also has less pore space and contains less water. Capability unit IIIw–2; woodland suitability group 2w2.

Tiro Series

The Tiro series consists of nearly level to gently sloping, somewhat poorly drained soils. These soils formed in a silty and loamy lacustrine material and in the underlying silty clay loam glacial till. They are on glaciated uplands that were covered with shallow glacial lake water. The Tiro soils are in the southwestern part of the county.

In a representative profile in a cultivated area, the plow layer is dark-brown silt loam 8 inches thick. It is underlain by a 2-inch transitional layer of brown silt loam. The subsoil extends to a depth of 45 inches. The upper 19 inches is mottled, yellowish-brown and dark yellowish-brown, friable and firm silty clay loam. The next 7 inches is mottled, dark yellowish-brown, firm clay loam. The lower part of the subsoil and the underlying material, to a depth of 96 inches, is dark-brown silty clay loam

Tiro soils have slow permeability in the lower part of the subsoil and in the substratum. The available water capacity is high. These soils have a moderately deep to deep rooting zone that is acid in the upper part, unless limed. They have a perched seasonal high water table in winter and spring.

Tiro soils are mapped only in a complex with Bennington soils in Medina County. These two soils are in a complex pattern on the landscape and are not separated in this survey. Most areas containing Tiro soils are cleared and used for farming. Crop response to drainage and fertilizer is good. If adequate drainage is provided, the potential productivity is moderate.

Representative profile of Tiro silt loam, in an area of Bennington-Tiro loams, 0 to 2 percent slopes, in Chatham Township, about 2½ miles east of Chatham, about 1,500 feet north of State Route 162, and about 50 feet west of the Chatham-Lafayette Township line:

Ap—0 to 8 inches, dark-brown (10YR 4/3) silt loam; moderate, medium and fine, granular structure; friable; many roots; 1 percent coarse fragments; slightly acid; abrupt, smooth boundary.

A&B—8 to 10 inches, 70 percent brown (10YR 5/3) and 30 percent yellowish-brown (10YR 5/6) silt loam; few, fine, prominent, strong-brown (7.5YR 5/6) mottles; weak, fine, subangular blocky structure; friable; common rots; thin, continuous, brown (10YR 5/3) coatings on peds; 1 percent coarse fragments; strongly acid; clear, irregular boundary.

B1g—10 to 13 inches, yellowish-brown (10YR 5/4) light silty clay loam; many, fine, distinct, grayish-brown (10YR 5/2) mottles; weak, fine, subangular blocky structure; friable; common roots; thin, continuous, grayish-brown (10YR 5/2) coatings on peds; 1 percent coarse fragments; very strongly acid; clear, smooth boundary.

B21t—13 to 24 inches, yellowish-brown (10YR 5/4) light silty clay loam; many, medium, distinct, light brownish-gray (10YR 6/2) mottles; moderate, medium, subangular blocky structure; firm; few roots; thin, continuous, light brownish-gray (10YR 6/2) coatings on peds; thin, very patchy, light brownish-gray (10YR 6/2) clay films; few fine, black (10YR 2/1) stains; 1 percent coarse fragments; very strongly acid; clear, smooth boundary.

B22tg—24 to 29 inches, dark yellowish-brown (10YR 4/4) light silty clay loam; many, medium, distinct, gray (10YR 4/1) mottles; weak, coarse, prismatic structure parting to moderate, coarse, subangular blocky; firm; few roots; thin, continuous, gray (10YR 6/1) coatings on peds; thin, patchy, gray (10YR 5/1) clay films; common, fine, black (10YR 2/1) stains; 1 percent coarse fragments; slightly acid; clear, wavy boundary.

IIB31tg—29 to 36 inches, dark yellowish-brown (10YR 4/4) light clay loam; many, medium, distinct, gray (10YR 5/1) mottles and common, fine, distinct, yellowish-brown (10YR 5/6) mottles; weak, coarse, subangular blocky structure; firm; few roots; thin, continuous, gray (10YR 5/1) coatings on peds; thin, patchy, gray (10YR 5/1) clay films; common, medium, black (10YR 2/1) stains; 5 percent gravel; neutral; clear, wavy boundary.

IIIB32g—36 to 45 inches, dark-brown (10YR 4/3) silty clay loam; many, medium, distinct, gray (10YR 6/1) mottles and common, fine, distinct, yellowish-brown (10YR 5/6) mottles; weak, thick, platy structure; firm; common, medium, black (10YR 2/1) stains; 3 percent coarse fragments; neutral; clear, wavy boundary.

IIIC—45 to 96 inches, dark-brown (10YR 4/3) silty clay loam; massive; firm; common, fine, distinct, gray (10YR 5/1) streaks; 5 percent coarse fragments; mildly alkaline; strong effervescence.

The solum ranges from 30 to 50 inches in thickness. The Ap horizon is dark grayish brown (10YR 4/2) or dark brown (10YR 4/3). In undisturbed areas an A1 horizon is present. It ranges from 1 inch to 4 inches in thickness and is very dark gray (10YR 3/1) or very dark grayish brown (10YR 3/2). An A2 horizon underlies the A1 horizon. It is 2 to 8 inches thick and has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 2 or 3. An A&B or B&A horizon is present in most profiles. The B horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 1 to 6. Ped surfaces have a grayish coating and chroma of 2 or less. The B horizon is silty clay loam or heavy silt loam in the upper part, light clay loam, loam, or sandy loam in

the IIB part, and silty clay loam in the IIIB part. The more loamy middle section is 2 to 15 percent gravel. Reaction ranges from medium acid to very strongly acid in the upper part of the B horizon, and it increases to slightly acid or neutral in the lower part. The C horizon is silty clay loam that is 5 to 15 percent coarse fragments.

Tiro soils are adjacent to somewhat poorly drained Bennington soils. Tiro soils differ from Bennington soils by having more silt in the upper part of the solum. Tiro soils are similar to Fitchville soils, but they are underlain by glacial till and lack evidence of stratification that is common to the underlying material of Fitchville soils.

Wadsworth Series

The Wadsworth series consists of nearly level to gently sloping, somewhat poorly drained soils. These soils formed in glacial till. They are on uplands in the southern and east-central parts of the county.

In a representative profile the surface layer is dark grayish-brown silt loam 5 inches thick. The subsurface layer is 4 inches of mottled, light brownish-gray silt loam. The subsoil extends to a depth of 52 inches. The upper 12 inches is mottled, yellowish-brown, firm and very firm silty clay loam, and the lower part is a dense compact, fragipan of mottled, yellowish-brown clay loam and brown silt loam. The underlying material, between depths of 52 and 80 inches, is dark grayish-brown silt loam.

Wadsworth soils have slow permeability in the fragipan and underlying glacial till. The available water capacity is moderate. These soils have a moderately deep rooting zone that is medium acid to very strongly acid, unless limed. The rooting zone and movement of water are restricted by a fragipan in the subsoil. A seasonal water table is perched above the fragipan.

These soils have a moderate potential productivity. Artificial drainage is beneficial to crops on these soils.

Representative profile of Wadsworth silt loam, 0 to 2 percent slopes, in Guilford Township, 2.5 miles northeast of Seville, 2,000 feet north of U.S. Highway 224, 200 feet east of County Road 41 (Guilford Road) (sample MD–13 in laboratory data section):

Ap—0 to 5 inches, dark grayish-brown (2.5Y 4/2) silt loam; moderate, fine and medium, granular structure; friable; many fine roots; very strongly acid; clear, wavy boundary.

A2—5 to 9 inches, light brownish-gray (2.5Y 6/2) silt loam; many, fine, distinct, yellowish-brown (10YR 5/8) mottles; weak, thick, platy structure; friable; many fine roots; 4 percent coarse fragments; very strongly acid; clear, smooth boundary.

B1—9 to 15 inches, yellowish-brown (10YR 5/4) silty clay loam; many, fine, prominent, olive-gray (5Y 5/2) mottles and many, fine, distinct, yellowish-brown (10YR 5/6) mottles; moderate, medium, subangular blocky structure; firm; common fine roots; light brownish-gray (2.5Y 6/2) silt coatings on horizontal and vertical faces of peds; 4 percent coarse fragments; very strongly acid; clear, smooth boundary.

B2t—15 to 21 inches, yellowish-brown (10YR 5/6) silty clay loam; common fine distinct light brownish-gray (2.5Y 6/2) mottles; moderate, coarse, prismatic structure parting to weak, coarse, subangular blocky; very firm; common fine roots; medium, continuous, gray (5Y 5/1) coatings on vertical surfaces of peds, and medium, patchy, gray (5Y 5/1) clay films on horizontal surfaces of peds; 5 percent coarse fragments; very strongly acid; clear, wavy boundary.

Bx1—21 to 36 inches, yellowish-brown (10YR 5/4) clay loam; many, fine, prominent, olive-gray (5Y 5/2) mottles and common, fine, prominent, yellowish-red (5YR 5/6) mottles; weak to moderate, very coarse, prismatic structure parting to moderate, coarse, subangular blocky; extremely firm; brittle; few fine roots along prism faces; continuous, thick, dark-gray (5Y 4/1) coatings and thin, patchy clay films on vertical surfaces of peds; black (10YR 2/1) stains; 5 percent coarse fragments; very strongly acid at a depth of 21 to 28 inches; medium acid at a depth of 28 to 36 inches; clear, wavy boundary.

Bx2—36 to 52 inches, brown (10YR 4/3) silt loam; common, fine, prominent, gray (5Y 5/1) mottles and few, fine, distinct, yellowish-brown (10YR 5/6) mottles; moderate, very coarse, prismatic structure parting to moderate, coarse, subangular blocky; very firm; brittle; few fine roots along prism faces; continuous, medium, gray (5Y 5/1) coatings in vertical fractures; thin, patchy clay films on prism surfaces; thin yellowish-brown (10YR 5/6) rind between prism matrix and coatings; 10 percent coarse fragments; slightly acid at a depth of 36 to 44 inches; neutral at a depth of 44 to 52 inches; clear, wavy boundary.

C1—52 to 70 inches, dark grayish-brown (10YR 4/2) silt loam; common, fine, prominent, gray (N 5/0) mottles and common, fine, distinct, yellowish-brown (10YR 5/6) mottles; massive; very firm; 10 percent coarse fragments; moderately alkaline; strong effervescence; gradual, smooth boundary.

C2—70 to 80 inches, dark grayish-brown (10YR 4/2) silt loam; massive; very firm; 10 percent coarse fragments; moderately alkaline; strong effervescence.

The solum ranges from 35 to 60 inches in thickness. Depth to calcareous material ranges from 40 to 60 inches. In undisturbed areas the A1 horizon is very dark grayish brown (10YR 3/2) and is 1 inch to 4 inches thick. The A2 horizon includes matrix colors of grayish-brown (10YR 5/2 or 2.5Y 5/2), light brownish gray (10YR 6/2), brown (10YR 5/3), and pale brown (10YR 6/3). The B1 horizon is yellowish brown (10YR 5/4) or brown (10YR 5/3). The B2t horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 4 to 6. The B2t horizon is clay loam or silty clay loam. Depth to the top of the fragipan ranges from 20 to 28 inches. It is about 15 to 32 inches thick and is mainly light clay loam or light silty clay loam, but in some places it is heavy loam or silty loam. The interior of its prism ranges from light olive brown (2.5Y 5/4) and olive brown (2.5Y 4/4) to brown (10YR 4/3) or yellowish brown (10YR 5/4).

Unless limed, the profile is typically very strongly acid or strongly acid in the horizons above the fragipan and very strongly acid to medium acid in the upper part of the fragipan. The lower part of the fragipan is slightly acid to neutral.

Wadsworth soils are the somewhat poorly drained member of a drainage sequence that includes moderately well drained Rittman soils. They are generally adjacent to the Rittman soils.

WaA—Wadsworth silt loam, 0 to 2 percent slopes. This nearly level soil is on uplands. The areas are variable in shape and size. The smaller areas, less than 10 acres in size, are oblong to oval. The larger areas are on broad, flat uplands and are irregular in shape. These areas are as large as 600 acres. This soil has the profile described as representative of the series.

Included with this soil in mapping are small areas of the wetter Sebring, till substratum, and Miner soils. These included soils are in depressions where water accumulates during wet periods. Also included are a few thin pockets of soils that are higher in sand and gravel than this Wadsworth soil.

Excessive wetness is the main limitation to the use of this soil for cultivated crops. Runoff is slow, and the surface layer is susceptible to crusting. Soil wetness

and slow permeability are limitations for many nonfarm uses. Capability unit IIIw–4; woodland suitability group 2w4.

WaB—Wadsworth silt loam, 2 to 6 percent slopes. This gently sloping soil is in areas near the heads of and adjacent to drainageways and on the more gently rising areas of the uplands. These areas are variable in shape, and they range from 5 acres to about 250 acres in size.

Included with this soil in mapping are areas of better drained Rittman soils on a few small knolls. In some areas are soils that have thin layers that are more sandy than those of this Wadsworth soil.

In areas where slopes are long, water moves laterally downslope along the surface of the fragipan. In some areas this water appears downslope as seep spots. Seasonal wetness is the principal limitation to the use of this soil for crops. Erosion is a hazard, particularly where slopes are long. Wet soil conditions and slow permeability are limitations for many nonfarm uses. Capability unit IIIw–4; woodland suitability group 2w4.

WbB—Wadsworth-Urban land complex, undulating. This complex consists of gently sloping areas in the city of Medina. It includes the residential area in the southern part of the city and the major industrial area in the southwestern part. Much of the natural soil has been destroyed or covered as the result of grading and digging. Thus, this complex now consists of areas of cut and fill land; areas that are covered by buildings, streets, and driveways; and areas of relatively undisturbed Wadsworth soils.

About 45 percent of the total land area is cut and fill land, of which the fill land part is dominant. This percentage is an average for both the residential and industrial areas. The percentage of cut and fill land is higher in the industrial areas. The fill land areas are characterized by having 1 foot to 4 feet of fill material overlying Wadsworth soils. Typically, the fill material is from building and street excavations, which in turn is spread on the lot adjacent to the excavated areas. The thicker layers of fill commonly are near the building, and their thickness becomes less as the fill is spread away from the building or excavated area. In the industrial areas there are places where grading and filling have been extensive. The fill material consists mainly of Wadsworth subsoil material, but in some places it is limy glacial till material. The cut land areas are characterized by exposed subsoil or substratum material typical of that of the Wadsworth soils. These areas are commonly adjacent to streets, where cuts were made into the landscape. Other areas consist of reshaped knolls and banks of excavated areas.

About 30 percent of the complex is covered by buildings, streets, driveways, and parking lots. This is the urban land part of the complex.

The rest of the complex is relatively undisturbed Wadsworth soils. These soils are in undeveloped lots and parts of developed lots. Included with the undisturbed soils are areas that are covered with a thin layer of fill material less than 1 foot thick.

The surface layer of the soils in the disturbed areas of this mapping unit is commonly low in organic-matter content and has less favorable physical properties than that in the undisturbed areas. Landscaping is very difficult in areas of cut land that have the dense fragipan or limy glacial till, or both, exposed at or near the surface. Topsoil spread on these areas is very beneficial for establishing and maintaining lawns. Large amounts of fertilizer are also needed, along with surface or subsurface drainage, or both.

The hazard of erosion is slight to moderate during the construction period when the soils are bare of vegetation. Soil wetness, moderate shrink-swell potential, and high potential frost action are limitations for many nonfarm uses. Not assigned to a capability unit or a woodland suitability group.

Wallkill Series

The Wallkill series consists of nearly level, poorly drained soils. These soils formed in 16 to 40 inches of alluvium and in the underlying muck. They are in nearly level to slightly concave pockets that are sites of former lakes.

In a representative profile the plow layer is very dark brown silt loam 9 inches thick. Below this, to a depth of 21 inches, is a dark-gray and gray, firm silty clay loam that is mostly mottled. Between depths of 21 and 56 inches is a very dark gray, friable muck that is underlain by dark grayish-brown sedimentary peat at a depth of 56 to 72 inches.

Wallkill soils have moderately slow permeability. The available water capacity is high. An apparent water table is at or near the surface most of the year, unless these soils are artificially drained. If sufficient drainage is provided, these soils have a deep rooting zone. The soils receive runoff from the surrounding land; consequently, local flooding and ponding are common during periods of high runoff.

These soils are not extensive in Medina county. Some areas have been drained and are used for crops. Most undrained areas are pastured during the dry summer months. These soils have a high potential productivity.

Representative profile of Wallkill silt loam in a cultivated field in Granger Township, 250 feet south of Beachler Road and Wilbur Road junction and about 1,200 feet east of Beachler Road:

Ap—0 to 9 inches, very dark brown (10YR 2/2) silt loam; moderate, medium, granular structure; friable; many roots; medium acid; abrupt, smooth boundary.

B21g—9 to 14 inches, dark-gray (10YR 4/1) heavy silty clay loam; moderate, medium, subangular blocky structure; firm; common roots; medium acid; clear, smooth boundary.

B22g—14 to 21 inches, gray (10YR 5/1) heavy silty clay loam; few, fine, distinct, yellowish-brown (10YR 5/6) mottles; weak, coarse, prismatic structure parting to weak, coarse, angular blocky; firm; few roots; slightly acid; clear, wavy boundary.

IIOa1—21 to 30 inches, very dark gray (10YR 3/1) broken and rubbed sapric material; 25 percent fiber, 1 percent rubbed; massive; friable; slightly sticky; neutral; gradual, wavy boundary.

IIOa2—30 to 56 inches, very dark gray (10YR 3/1) broken face and very dark grayish-brown (10YR 3/2) rubbed sapric material; 35 percent fiber, 5 percent rubbed; massive; friable; slightly sticky; neutral; clear, wavy boundary.

IIILco—56 to 72 inches, dark grayish-brown (2.5Y 4/2) coprogenous earth; massive; friable; mildly alkaline.

The mineral soil over organic material ranges from 16

to 40 inches in thickness. Reaction of the mineral soil is strongly acid to neutral. The Ap horizon ranges from very dark brown (10YR 2/2) to dark grayish brown (10YR 4/2). The B horizon ranges from fine sandy loam to light silty clay. The matrix of the B horizon is variable in color. Hue is from 7.5YR to 5Y, or it is neutral in places. Value is 4 to 6, and chroma is 1 to 3.

Wallkill soils in Medina County contain slightly more clay in the mineral soil layers than is defined as within the range for the Wallkill series. This difference does not affect the use and behavior of these soils.

The Wallkill soils are most commonly adjacent to poorly drained Sebring soils and somewhat poorly drained Orrville soils. They have a layer of muck below the subsoil, which Sebring and Orrville soils lack.

Wc—Wallkill silt loam. The two largest areas of this nearly level soil are along Chippewa Ditch, north of Chippewa Lake and along Granger Ditch just east of State Route 94. These large areas are irregular in shape and about 100 acres in size. Most of the other areas are oblong or circular in shape and are less than 25 acres in size.

Included with this soil in mapping are small areas of soils that have less than 16 inches of alluvium over the organic layers. There is a notable variation in the thickness of the underlying organic layers. In some places these organic layers extend below a depth of 5 feet. In other places they are less than 20 inches thick. Sedimentary peat is the most common material underlying the organic layers, but in a few places the underlying material is stratified, thin-layered, loamy material.

Excessive wetness and hazard of flooding are the major limitations to the use of this soil for farming. The plow layer commonly has low organic-matter content and is susceptible to surface crusting. Developing and maintaining an adequate artificial drainage system is generally difficult on this soil. Wetness and soft, unstable soil material are limitations for many nonfarm uses. Capability unit IIw–6; woodland suitability group 2w1.

Willette Series

The Willette series consists of very poorly drained, black organic soils. These soils formed in muck deposits 16 to 48 inches thick. They are in swampy depressions on terraces and in potholes on hummocky uplands. The characteristic vegetation on these soils is reeds, sedges, and wetland shrubs.

In a representative profile the soil is mainly black muck to a depth of about 30 inches. Between depths of 30 and 36 inches, it is a very dark gray silty clay loam.

These soils have moderately rapid permeability in the muck and slow permeability in the underlying mineral material. The available water capacity is high. Because these soils are normally saturated with free water, they must be drained before they can be used for crops. If artificially drained, they have a moderately deep rooting zone.

Most areas of Willette soils have been cleared and drained and are cultivated. If drained and properly managed, the soils are well suited to most crops. Some areas are pastured. The potential productivity is high.

Representative profile of Willette muck in a cultivated field in Harrisville Township, about 1.6 miles south of Lodi, 3,500 feet north of Garden Isle Road and Willow Road junction and about 1,100 feet east of Garden Isle Road (sample MD–22 in laboratory data section):

Oa1—0 to 7 inches, black (10YR 2/1), broken and rubbed, sapric material; about 5 percent fiber, less than 1 percent rubbed; moderate, medium, crumb structure; sticky; loose; many roots; 20 percent mineral material; few fine gypsum crystals; pyrophosphate extract dark brown (7.5YR 4/4); strongly acid; abrupt, smooth boundary.

Oa2—7 to 15 inches, black (10YR 2/1), broken and rubbed, sapric material; about 2 percent fiber, less than 1 percent rubbed; weak, medium, subangular blocky structure; sticky; friable; few roots; 20 percent mineral material; common fine gypsum crystals; pyrophosphate extract dark brown (7.5YR 4/4); strongly acid; abrupt, smooth boundary.

Oa3—15 to 24 inches, black (10YR 2/1), broken and rubbed, sapric material; about 2 percent fiber, less than 1 percent rubbed; weak, medium, subangular blocky structure; sticky; firm; few roots; 20 percent mineral material; common fine gypsum crystals; pyrophosphate extract brown (7.5YR 5/4); extremely acid; clear, smooth boundary.

Oa4—24 to 30 inches, very dark gray (10YR 3/1) broken, black (10YR 2/1) rubbed sapric material; about 2 percent fiber, less than 1 percent rubbed; weak, medium, subangular blocky structure; sticky; firm; few roots; 30 percent mineral material; common fine gypsum crystals; pyrophosphate extract brown (7.5YR 5/4); extremely acid; abrupt, smooth boundary.

Oa5—30 to 36 inches, very dark gray (10YR 3/1) silty clay loam; weak, medium, prismatic structure; sticky; few roots; extremely acid; abrupt, smooth boundary.

IIC1—36 to 46 inches, gray (5Y 5/1) heavy silty clay loam; common, medium, distinct, light olive-brown (2.5Y 5/4) mottles; massive; sticky and plastic; extremely acid; gradual boundary.

IIC2—46 to 60 inches, gray (N 5/0) heavy silty clay loam; massive; sticky and plastic; medium acid.

The thickness of the organic material ranges from 16 to 48 inches. The reaction in the Oa horizon is from extremely acid to medium acid. The IIC horizon has common stratification. It is mostly heavy silty clay loam, but there are thin layers of silt loam, silty clay, clay loam, or clay in places. It is from extremely acid to neutral.

Willette soils are on landscapes similar to those of Carlisle and Linwood soils. They formed in thinner organic materials than Carlisle soils. They have a C horizon that has a higher content of clay than the C horizon in Linwood soils. Willette soils are adjacent to many different mineral soils on uplands and terraces.

Wt—Willette muck. This nearly level soil generally is in areas less than 10 acres in size. The largest area is about 200 acres in size and is in the large muck area south of Lodi.

Included with this soil in mapping are a few small areas of soils where the organic material is less than 16 inches thick. Also included are small areas of Carlisle soils. There are a few areas that are underlain by thin strata of loamy material.

This soil is swampy in undrained areas. It is soft, compressible, and unstable. It is susceptible to subsidence and soil blowing if drained. Drainage outlets are difficult to establish for many areas of this soil. Also, this soil tends to act as a catch basin for surface water draining from the adjacent higher lying soils.

A high water table is the dominant limitation to the use of this soil for crops. This soil is suitable for irrigation. Low strength, high water table, and hazard of

ponding are limitations for most nonfarm uses. Capability unit IIIw-3; woodland suitability group 5w1.

Wooster Series

The Wooster series consists of deep, gently sloping to very steep, well-drained soils. These soils formed in loam glacial till. They are on uplands in the southeastern and eastern part of the county.

In a representative profile the plow layer is brown silt loam 7 inches thick. The subsoil extends to a depth of 56 inches. The upper 6 inches is yellowish-brown, friable silt loam. The next 18 inches is a dark yellowish-brown and dark-brown, friable and firm loam. The next 11 inches is a fragipan of dark-brown, very firm and brittle loam. Below this, to a depth of 75 inches, yellowish-brown and dark-brown loam.

Wooster soils have moderate permeability above the fragipan and moderately slow permeability in the fragipan and in the underlying material. The available water capacity is moderate. These soils have a moderately deep to deep rooting zone that is medium acid to very strongly acid, unless limed. In places a temporary perched water table of short duration is above the fragipan during wet periods, but artificial drainage is not needed if crops are grown. These soils warm up and dry out early in spring.

The less sloping Wooster soils are commonly cultivated. The more sloping areas are in woods or pasture. If cultivated, the main crops grown are grass-legumes, wheat, oats, and corn. These soils have a moderate potential productivity.

Representative profile of Wooster silt loam, 6 to 12 percent slopes, moderately eroded, in a meadow in Sharon Township, 2,200 feet west of State Route 162 and Medina Line Road junction, 600 feet south of State Route 162:

Ap—0 to 7 inches, brown (10YR 5/3) silt loam that is 30 percent yellowish-brown (10YR 5/4) subsoil material; moderate, fine, granular structure; friable; many roots; 8 percent pebbles; neutral; abrupt, smooth boundary.

B1—7 to 13 inches, yellowish-brown (10YR 5/4) silt loam; weak, fine, subangular blocky structure; friable; common roots; many fine and medium pores; brown (10YR 5/3) coatings in root and worm channels; 5 percent pebbles; slightly acid; clear, wavy boundary.

B21t—13 to 22 inches, dark yellowish-brown (10YR 4/4) loam; moderate, medium, subangular blocky structure; friable; common roots; many fine and medium pores; thin, very patchy, dark-brown (7.5YR 4/4) clay films on ped surfaces; thin, patchy, brown (10YR 5/3) coatings on ped surfaces; 5 percent pebbles; medium acid; clear, wavy boundary.

B22t—22 to 31 inches, dark-brown (10YR 4/3) loam; weak, very coarse, prismatic structure parting to moderate, medium, subangular blocky; firm; brittle zones in 25 percent of mass; few roots along ped surfaces and within peds; thick, continuous, light brownish-gray (10YR 6/2) prism coatings and thin, patchy clay films on ped surfaces and in fine pores; few, fine, black (10YR 2/1) stains; 5 percent pebbles; very strongly acid; clear, wavy boundary.

Bx—31 to 42 inches, dark-brown (10YR 4/3) loam; weak, very coarse, prismatic structure parting to moderate, thick, platy; very firm; brittle; few roots along prism faces; thick, continuous, gray (10YR 6/1) coatings on vertical prism surfaces and a thin yellowish-brown (10YR 5/8) rind between the coatings and prism interiors; thin, patchy clay films on ped surfaces; common, fine, black (10YR 2/1) stains; 5 percent pebbles; very strongly acid; gradual, smooth boundary.

B3t—42 to 56 inches, yellowish-brown (10YR 5/4) heavy loam; common, fine, distinct, gray (10YR 6/1) mottles; weak, very coarse, prismatic structure parting to weak, coarse, subangular blocky; firm; moderate, continuous, gray (10YR 6/1) coatings on vertical prism surfaces and a thin, yellowish-brown (10YR 5/6) rind between the coatings and prism interiors; thin, patchy clay films on ped surfaces; few, fine, black (10YR 2/1) stains; 3 percent pebbles; strongly acid; clear, wavy boundary.

C—56 to 75 inches, dark-brown (10YR 4/3) light loam; common, fine, distinct, gray (10YR 6/1) mottles; massive; firm; 3 percent pebbles; medium acid grading to neutral at a depth of 70 inches.

Thickness of the solum ranges from 40 to 65 inches. Depth to neutral or mildly alkaline material ranges from 50 to 100 inches or more. The Ap horizon is dark grayish brown (10YR 4/2), dark brown (10YR 4/3), or brown (10YR 5/3). In undisturbed areas the A1 horizon is 1 inch to 4 inches thick and has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. The A2 horizon, if present, is 2 to 8 inches thick and has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. A B1 horizon of silt loam or loam is common in most profiles. It is dark yellowish brown (10YR 4/4) or yellowish brown (10YR 5/4 or 5/6). The B2 horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 to 6. It is loam or silt loam. The top of the Bx horizon is at a depth of 24 to 34 inches, and its thickness ranges from 10 to 30 inches. It is generally loam, but in some places it is silt loam. The interiors of the prisms are dark brown (10YR 4/3) or dark yellowish brown (10YR 4/4). The solum is typically very strongly acid to medium acid unless limed. Bedrock commonly underlies this soil at a depth of 5 feet to about 12 feet.

Wooster soils are the well-drained member of a drainage sequence that includes the moderately well drained Canfield soils and the somewhat poorly drained Ravenna soils. They are commonly adjacent to these two soils. In some places they are adjacent to Loudonville soils. Wooster soils differ from Loudonville soils because they have a fragipan and are deeper to bedrock.

WuB—Wooster silt loam, 2 to 6 percent slopes. This gently sloping soil is on broad side slopes and ridgetops. In places it has long, nearly uniform slopes. Most areas of this soil are 5 to 75 acres in size. This soil receives little or no runoff from surrounding soils. This soil is only slightly eroded. It has slightly higher organic-matter content, higher available water capacity, and slightly greater depth to the fragipan than the moderately eroded Wooster soils.

Included with this soil in mapping are spots of moderately well drained Canfield soils. These wetter soils are mainly in the more nearly level areas and in seep spots. Also included are spots of Loudonville soils, particularly where they are adjacent to areas of this soil. In some areas the fragipan is very weak or is absent.

Runoff is slow to medium and the hazard of erosion is moderate if this soil is used for cultivated crops. Moderately slow permeability and moderate potential frost action are limitations for some nonfarm uses. Capability unit IIe-3; woodland suitability group 1o1.

WuB2—Wooster silt loam, 2 to 6 percent slopes, moderately eroded. This gently sloping soil is in slightly convex areas on uplands. In some areas the slopes are uniform and long and are as large as 75 acres in size. Other areas are on short side slopes along drainageways. These areas are generally less than 10 acres in

size. Part of the original surface layer has been lost through erosion. This has reduced the organic-matter content, the available water capacity, and the depth to fragipan. This soil generally is less productive than the less eroded Wooster soils.

Included with this soil in mapping are small areas of Canfield and Loudonville soils. There are some areas of soils in which the fragipan is very weak or is absent.

Runoff is moderate to rapid, especially when the surface is not protected by a cover of plants. The hazard of erosion is moderate if this soil is cultivated. Moderately slow permeability and moderate potential frost action are limitations for some nonfarm uses. Capability unit IIe–3; woodland suitability group 1o1.

WuC2—Wooster silt loam, 6 to 12 percent slopes, moderately eroded. This sloping soil is mainly in long, narrow areas on hillsides, but there are also smaller, oblong to irregularly shaped areas along drainageways. Most areas are less than 20 acres in size. This soil has the profile described as representative of the series.

Included with this soil in mapping are spots of the wetter Canfield soils. Also included are a few areas of slightly eroded soils that have a thicker, darker colored surface layer than this Wooster soil; small areas of soils that have thin layers of sandy and gravelly material within the profile and that generally lack a fragipan; and areas of soils in which the fragipan is intermittent or absent. Shallow drainageways are common in some areas of this Wooster soil. There are some areas, commonly adjacent to areas of Loudonville soils, where bedrock is at a depth of slightly more than 5 feet.

A severe hazard of erosion is the main limitation to the use of this soil for cultivated crops. Runoff is medium to rapid. Slope and moderately slow permeability are limitations for many nonfarm uses. Capability unit IIIe–1; woodland suitability group 1o1.

WuE2—Wooster silt loam, 12 to 25 percent slopes, moderately eroded. This moderately steep to steep soil is in narrow strips along drainageways and in U-shaped areas at the head of drainageways. Most areas are less than 20 acres in size.

Included with this soil in mapping are small areas of the wetter Canfield soils. Also included are a few spots of slightly eroded soils that have a thicker, darker colored surface layer than this Wooster soil; small areas of soils that have thin layers of sandy and gravelly material within the profile and that generally lack a fragipan; and areas of soils in which the fragipan is intermittent or is absent. Shallow drainageways are common in some areas of this Wooster soil. There are some areas, commonly adjacent to areas of Loudonville soils, where bedrock is at a depth of slightly more than 5 feet.

A severe hazard of erosion is the main limitation to the use of this soil for cultivated crops. Runoff is medium to rapid. Slope and moderately slow permeability are limitations for many nonfarm uses. Capability unit IVe–2; woodland suitability group 1r1.

WuF—Wooster silt loam, 25 to 70 percent slopes. This very steep soil is mainly on side slopes of U-shaped valleys that are formed by deeply entrenched drainageways. Typically, the slopes are short and the areas are oblong in shape and less than 15 acres in size. The fragipan is not well expressed in most areas of this soil. Where present, the fragipan is closer to the surface and thinner than in the profile described as representative of the series. Most areas of this soil are wooded and have slopes greater than 35 percent.

Runoff is very rapid. A severe hazard of erosion and the very steep slopes are the main limitations to the use of this soil for farming and for most nonfarm uses. Capability unit VIIe–2; woodland suitability group 1r2.

Formation and Classification of the Soils

This section discusses the factors and processes of soil formation and explains the effects they have had on the formation of soils in Medina County. It also explains the current system of soil classification and places the soil series in some categories of this system.

Factors of Soil Formation

Unique soils are formed as the result of complex interactions among principal soil-forming factors. How soils were formed and thus acquired their present character at any given geographical point depends upon five factors: (1) physical and mineralogical composition of the parent material, (2) relief, or lay of the land, (3) the climate under which the soil material has accumulated and existed, (4) plant and animal life in and on the soil, and (5) the length of time the forces of soil formation have acted upon the parent material.

Climate, vegetation, and plant and animal life are active factors in soil formation. Plants and animals, influenced by climate, act upon parent material and gradually change it into a natural body that has genetically related horizons. The effects of climate and vegetation during soil development are modified by the parent material and by the relief which influences drainage. The parent material and the relief, along with the other factors of soil development, determine the kind of soil profile that is formed, and in some cases they determine it almost entirely.

Time is required for the active soil-forming factors to transform parent material into a soil. Weathering, leaching, translocation of soil particles, and other soil-forming processes require time to differentiate horizons in the soil parent material.

Parent material

Parent material from which a soil develops is the unconsolidated mass of material resulting from the weathering of rocks. Some kinds of parent material are derived from bedrock, some have been transported into the county by glaciers. and some have been transported by wind or water. This parent material largely determines the chemical and mineralogical composition of soils.

The parent material in Medina County originated from glacial till, glacial outwash, lacustrine sediment, recent stream alluvium, and organic material. Soils that formed in glacial till are most extensive and have a wide range of characteristics. Bennington, Mahoning, and Wadsworth soils are a few examples. Soils that

formed in glacial outwash deposits are generally loamy textured and commonly are underlain by stratified sand and gravel. Examples of these soils are Jimtown, Bogart, and Chili soils. Some soils in the county formed in lacustrine or slack-water deposits of silty or clayey material. Examples of soils that formed in lacustrine deposits are Fitchville, Luray, and Lorain soils. Soils on the flood plain formed in recent alluvium. They are commonly medium textured and have little or no profile development. Examples of these soils are Chagrin, Orrville, and Lobdell soils. Soils that formed in organic material are muck. An example of these is Carlisle soils.

Climate

Medina County has a humid, temperate, and continental climate. Soils in the county developed under the influence of this type of climate in a region forested with deciduous hardwood trees.

Climate, among other influences, greatly regulates the rate of weathering and decomposition of minerals, and so it is important to soil development. Important climatic factors include precipitation, temperature, and the evapotranspiration ratio. On a regional basis, these factors determine the kinds of soils that form. In an area the size of Medina County, the climate is fairly uniform and soil differences are determined more by local differences in vegetation, parent material, relief, drainage, and the age of soil materials.

Climate has influenced the removal of material by leaching. Because soluble bases are removed as they are released by decomposition from mineral material, the soils that formed are acid. Translocation of clay and sesquioxides is accomplished when water percolates from the surface to lower horizons. Most soils of the county are naturally acid, at least in the upper horizons, because the bases are continually leached downward. Mahoning and Ellsworth soils, as well as others, show evidence of clay movement from the A horizon to the B horizon.

The Condit and Miner soils, because of their position on the landscape, formed under a wetter microclimate than most upland soils of the county. This results in saturation for extended lengths of time and in gleying that is caused by the reduction and leaching of iron.

A further discussion concerning climatic data for the county is given in the section "General Nature of the County."

Relief

Relief influences soil development by its effect on water relationships, erosion, temperature relationships, and plant cover. Runoff, ponding, depth to water table, internal drainage, and accumulation and removal of organic matter are directly or indirectly affected by slope.

Relief can account for the development of different soils from the same kind of parent material. For this reason, among the external features of soils, relief is often most reliable in differentiating many soil series. Commonly a given set of soil characteristics is related to slope and internal drainage. This is illustrated in comparing the Condit, Mahoning, and Ellsworth soils, all of which formed in Wisconsin glacial till.

Runoff on sloping soils collects in depressions or is removed through drainage systems. Therefore, from equivalent rainfall, sloping soils receive less water and depressional soils receive more water than do soils of flat landscapes. Soils that have complex, gentle slopes generally show the greatest degree of development because the soil is neither saturated or droughty. Steep soils, however, show a lesser degree of development than gently sloping soils because more water runs off, and consequently less water enters the soil.

Living organisms

All living organisms, including man, are important to soil formation. Vegetation is generally responsible for the amount of organic matter, the color of the surface layer and the amount of nutrients in a soil. Animals such as earthworms, cicadas, and burrowing animals help keep the soil open and porous. Bacteria and fungi decompose the vegetation, thus releasing nutrients for plant food. Man has greatly influenced the surface layer where he has cleared the trees and plowed the land. He has added fertilizers, mixed some of the upper horizons, and has moved the soil material from place to place.

The original vegetation in Medina County was mainly deciduous forest. The main species of trees on the somewhat poorly drained to poorly drained soils were black ash, white ash, American elm, shagbark hickory, American basswood, swamp white oak, white oak, bur oak, pin oak, American sycamore, silver maple, and eastern cottonwood. On the better drained sloping soils and along streams, the common trees were sugar maple, American beech, white oak, and northern red oak.

A few soils in the county formed in swampy areas under grasses and sedges. The more extensive areas of these soils are the muck soils and the commonly adjacent Lorain, Luray, and Sebring soils.

Time

The length of time that parent material has been exposed to soil-forming elements is important to soil development. Generally, the longer the time that climatic elements and plant and animal life have acted upon parent material, the more distinct are the horizons of the soil profile. The distinctiveness of the horizons indicates relative maturity of soils.

The soils of Medina County have developed in the period since the last glaciation, which was about 10,000 to 15,000 years ago. In the steeper areas geologic erosion has kept pace with soil development. Thus, the horizons are thinner and the depth to parent material is only a few inches in places. Soils in the rolling and flat areas, such as Mahoning soils, are much thicker and depth to underlying material is generally deeper than 24 inches.

Soils that formed on recent flood plain alluvium, such as Orrville, Lobdell, and Chagrin soils, have no strongly differentiated horizons. The time necessary for other soil-forming factors to significantly influence the soil has not elapsed. These are the youngest and least developed soils in the county.

Processes of Soil Formation

Basic chemical and physical processes such as oxidation, reduction, hydration, hydrolysis, solution, eluvia-

tion, and illuviation bring about additions to, losses from, and transfer and transformations within soils (*13*). These many processes, influenced by the interrelationships of the soil-forming factors, are responsible for the changing of parent materials by steps and stages, none of which are distinct, to a youthful soil and finally to a mature soil or to one that is dynamically in equilibrium and its environment.

Additions to soils are made by additions of organic matter, sediment depositions, or accumulation of nutrients and colloidal material from sources such as organic matter, ground water, lime, and fertilizer. Except for soils on recent flood plains, all virgin soils have a surface layer of organic accumulation known as an A1 horizon. Cultivation, however, has since destroyed this layer, or severe erosion has removed all evidence of this horizon from the soil profile. Some nutrients move in a cycle from soil to plants and then back to the soil as by-products of organic matter decomposition. This is true for all soils in the county except where this process is modified by the harvesting of crops. Alluvial soils, such as Chagrin, Lobdell, and Orrville soils, periodically receive sediment deposits from floodwaters.

Soil losses are commonly caused by erosion, leaching of soluble salts, eluviation of colloids with percolating waters, and nutrient losses due to harvesting of crops. Leaching of carbonates accounts for the most significant soil nutrient losses in Medina County. Carbonates have been removed to a depth of 2 to 4 feet or more in upland soils such as Mahoning and Ellsworth soils. Recognizing that the parent material of these soils was 5 to 15 percent calcium carbonate equivalent, and that these soils are now acid in reaction, the tremendous change effected by leaching is illustrated. Other minerals present in soils often break down through a complicated series of processes and eventually are lost through leaching, but at a slower rate than are carbonates.

The decomposition of other minerals often produces free iron oxides, which account for the fairly bright brownish colors in the Chili and Oshtemo soils. The periodic or seasonal high water table in Sebring and Luray and other soils causes a reduction of iron oxides and subsequent loss by leaching. This process is mainly responsible for the gray color of the subsoil. The brownish mottling in an overall gray soil mass observed in Mahoning and Condit soils is caused by local accumulations of iron compounds or from localized oxidation of iron compounds. These conditions are an indication of a poorly drained soil.

Classification of the Soils

Soils are classified so that we can more easily remember their significant characteristics. Classification enables us to assemble knowledge about the soils, to see their relationship to one another and to the whole environment, and to develop principles that help us to understand their behavior and their response to manipulation. First through classification, and then through use of soil maps, we can apply our knowledge of soils to specific fields and other tracts of land.

The narrow categories of classification, such as those used in detailed soil surveys, allow us to organize and apply knowledge about soils in managing farms, fields, and woodlands; in developing rural areas; in engineering work; and in many other ways. Soils are placed in broad classes to facilitate study and comparison in large areas such as countries and continents.

The system of soil classification currently used was adopted by the National Cooperative Soil Survey in 1965 (*16*). Because this system is under continual study, readers interested in developments of the current system should search the latest literature available.[5]

The current system of classification has six categories. Beginning with the broadest, these categories are the order, the suborder, the great group, the subgroup, the family, and the series. In this system, the criteria used as a basis for classification are soil properties that are observable and measurable. The properties are chosen, however, so that the soils of similar genesis, or mode of origin, are grouped. In table 9, the soil series of Medina County are placed in three categories of the current system. The six categories of the current system are briefly defined in the following paragraphs.

ORDER: Ten soil orders are recognized. The properties used to differentiate among soil orders are those that tend to give broad climatic groupings of soils. The two exceptions to this are the Entisols and Histosols, which occur in many different climates. Each order is named with a word of three or four syllables ending in *sol* (Ent-i-sol).

SUBORDER: Each order is subdivided into suborders that are based mainly on those soil characteristics that produce classes with the greatest genetic similarity. The suborders narrow the broad climatic range permitted in the orders. The soil properties used to separate suborders are mainly those that reflect either the presence or absence of waterlogging, or soil differences resulting from the climate or vegetation. The names of suborders have two syllables. The last syllable indicates the order. An example is Aqualf (*Aqu*, meaning water or wet, and *alf*, from Alfisol).

GREAT GROUP: Soil suborders are separated into great groups on the basis of uniformity in the kinds and sequence of major soil horizons and features. The horizons used to make separations are those in which clay, iron, or humus has accumulated; those that have pans that interfere with growth of roots or movement of water, or both; and thick, dark-colored surface horizons. The features used are the self-mulching properties of clay, soil temperature, major differences in chemical composition (mainly calcium, magnesium, sodium, and potassium), dark-red and dark-brown colors associated with basic rocks, and the like. The names of great groups have three or four syllables and are made by adding a prefix to the name of the suborder. An example is Ochraqualfs (*Ochr*, meaning light-colored surface layer; *aqu* for wetness or water; and *alf*, from Alfisols).

SUBGROUP: Great groups are subdivided into subgroups, one representing the central (typic) segment of the group, and others called intergrades that have properties of the group and also one or more properties of another great group, suborder, or order. Sub-

[5] See the unpublished working document "Selected Chapters from the Unedited Text of the Soil Taxonomy," available in the SCS State Office, Columbus, Ohio.

TABLE 9.—*Classification of the soil series*

Series	Family	Subgroup	Order
Bennington	Fine, illitic, mesic	Aeric Ochraqualfs	Alfisols.
Berks	Loamy-skeletal, mixed, mesic	Typic Dystrochrepts	Inceptisols.
Bogart	Fine-loamy, mixed, mesic	Aquic Hapludalfs	Alfisols.
Canadice	Fine, illitic, mesic	Typic Ochraqualfs	Alfisols.
Caneadea	Fine, illitic, mesic	Aeric Ochraqualfs	Alfisols.
Canfield	Fine-loamy, mixed, mesic	Aquic Fragiudalfs	Alfisols.
Cardington [1]	Fine, illitic, mesic	Aquic Hapludalfs	Alfisols.
Carlisle	Euic, mesic	Typic Medisaprists	Histosols.
Chagrin	Fine-loamy, mixed, mesic	Dystric, Fluventic, Eutrochrepts	Inceptisols.
Chili	Fine-loamy, mixed, mesic	Typic Hapludalfs	Alfisols.
Condit	Fine, illitic, mesic	Typic Ochraqualfs	Alfisols.
Ellsworth	Fine, illitic, mesic	Aquic Hapludalfs	Alfisols.
Fitchville	Fine-silty, mixed, mesic	Aeric Ochraqualfs	Alfisols.
Geeburg	Fine, illitic, mesic	Aquic Hapludalfs	Alfisols.
Glenford [2]	Fine-silty, mixed, mesic	Aquic Hapludalfs	Alfisols.
Haskins	Fine-loamy, mixed, mesic	Aeric Ochraqualfs	Alfisols.
Holly	Fine-loamy, mixed, nonacid, mesic	Typic Fluvaquents	Entisols.
Jimtown	Fine-loamy, mixed, mesic	Aeric Ochraqualfs	Alfisols.
Linwood	Loamy, mixed, euic, mesic	Terric Medisaprists	Histosols.
Lobdell	Fine-loamy, mixed, mesic	Fluvaquentic Eutrochrepts	Inceptisols.
Lorain	Fine, illitic, mesic	Mollic Ochraqualfs	Alfisols.
Loudonville	Fine-loamy, mixed, mesic	Ultic Hapludalfs	Alfisols.
Luray [3]	Fine-silty, mixed, mesic	Typic Argiaquolls	Mollisols.
Mahoning	Fine-illitic, mesic	Aeric Ochraqualfs	Alfisols.
Miner	Fine, illitic, mesic	Mollic Ochraqualfs	Alfisols.
Olmsted	Fine-loamy, mixed, mesic	Mollic Ochraqualfs	Alfisols.
Orrville	Fine-loamy, mixed, nonacid, mesic	Aeric Fluvaquents	Entisols.
Oshtemo	Coarse-loamy, mixed, mesic	Typic Hapludalfs	Alfisols.
Ravenna	Fine-loamy, mixed, mesic	Aeric Fragiaqualfs	Alfisols.
Rawson	Fine-loamy, mixed, mesic	Typic Hapludalfs	Alfisols.
Rittman	Fine-loamy, mixed, mesic	Aquic Fragiudalfs	Alfisols.
Schaffenaker	Mesic, coated	Typic Quartzipsamments	Entisols.
Sebring	Fine-silty, mixed, mesic	Typic Ochraqualfs	Alfisols.
Tiro	Fine-silty, mixed, mesic	Aeric Ochraqualfs	Alfisols.
Wadsworth	Fine-silty, mixed, mesic	Aeric Fragiaqualfs	Alfisols.
Wallkill [4]	Fine-loamy, mixed, nonacid, mesic	Thapto-Histic Fluvaquents	Entisols.
Willette	Clayey, illitic, euic, mesic	Terric Medisaprists	Histosols.
Wooster	Fine-loamy, mixed, mesic	Typic Fragiudalfs	Alfisols.

[1] Cardington soils in Medina County are taxadjuncts to the series. They contain slightly less clay than is defined as within the range for the series, and they are classified as Aquic Hapludalfs; fine-loamy, mixed, mesic.

[2] Glenford soils in Medina County are taxadjuncts to the series. They are slightly more acid than is defined as within the range for the series.

[3] Luray soils in Medina County are taxadjuncts to the series. They are slightly more acid than is defined as within the range for the series.

[4] Wallkill soils in Medina County are taxadjuncts to the series. The mineral layers contain slightly more clay than is defined as within the range for the series, and they are classified as Thapto-Histic Fluvaquents; fine, mixed, nonacid, mesic.

groups may also be made in those instances where soil properties intergrade outside of the range of any other great group, suborder, or order. The names of subgroups are derived by placing one or more adjectives before the name of the great group. An example is Typic Ochraqualfs (a typical Ochraqualf).

FAMILY: Soil families are separated within a subgroup mainly on the basis of properties important to the growth of plants or on the behavior of soils when used for engineering. Among the properties considered are texture, mineralogy, reaction, soil temperature, permeability, thickness of horizons, and consistence. A family name consists of a series of adjectives preceding the subgroup name. The adjectives are the class names for texture, mineralogy, and so on, that are used as family differentiae (see table 9). An example is the fine, illitic, mesic family of Typic Ochraqualfs.

SERIES: The series has the narrowest range of characteristics of the categories in the classification system. It is defined in the section "How This Survey Was Made." A detailed description of each soil series in the county is given in the section "Descriptions of the Soils."

Some of the soils in this county do not fit a series that has been recognized in the classification system, but recognition of a separate series would not serve a useful purpose. Such soils are named for the series they strongly resemble because they differ from that series in ways too small to be of consequence in interpreting their usefulness or behavior. Soil scientists designate such soils taxadjuncts to the series for which they are named.

In this survey, soils named in the Cardington, Glenford, Luray, and Wallkill series are taxadjuncts to those series.

Laboratory Data

Laboratory data are given in table 10 for soil profiles representing eight soil series in Medina County. These data were obtained to aid in the classification and correlation of these soils. Analyses were made by the Agronomy Department, Ohio Agricultural Research and Development Center (OARDC), Columbus, Ohio. Except for the Rittman and Sebring soils, detailed descriptions of the soils in table 10 are given in "Descriptions of the Soils." Profile descriptions of the Rittman and Sebring soils are given in this section. They are representative of some areas of these soils in the county, but the profiles described in the "Descriptions of the Soils" are representative of most areas.

In addition to the data given in table 10, laboratory data are available for Bogart, Canfield, Chagrin, Chili, Ellsworth, Glenford, Jimtown, Lorain, Loudonville, Luray, Oshtemo, Ravenna, Rawson, Sebring, and Wooster soils. These data are on file at the Agronomy Department, OARDC, Columbus, Ohio; the Ohio Department of Natural Resources, Division of Lands and Soil, Columbus, Ohio; and the Soil Conservation Service, State Office, Columbus, Ohio.

Also available are data of physical and chemical analyses and of mineral analyses for the Bennington, Mahoning and Wadsworth soils. These data are published in the Soil Science Society of America Proceedings (*11*). The data indicate a dominance of illitic clay in the subsoil and substratum of these soils.

The following paragraphs outline some of the procedures used to obtain the data presented in table 10.

Particle-size distribution data were obtained by the pipette method outlined by Steele and Bradfield (*14*), but using sodium hexametaphosphate as the dispersing agent and a 10-gram soil sample. The sand fractions were determined by sieving. The fine silt and coarse clay (20 microns to 0.2 micron) were determined by gravity sedimentation in a centrifuge. Coarse silt was obtained by subtracting sand, fine silt, and clay from the total sample. All pH measurements were made by using a 1:1 soil-water ratio. The percentage of organic matter was determined by a dry combustion method. Calcium carbonate equivalent was determined by the quantitative gasometric method (*5*). Extractable calcium, magnesium, and potassium were extracted by neutral normal ammonium acetate and measured by atomic absorption spectrophotometer. Extractable hydrogen, which includes titratable aluminum, was determined by the triethanolamine method (*10*). The sum of extractable cations is the cation exchange capacity.

The profiles of Rittman silt loam and of Sebring silt loam, till substratum, from which samples shown in table 10 were taken are described as follows:

Rittman silt loam (MD–18), in Montville Township, T. 2 N., R. 14 W., 800 feet west of Poe Road and River Styx Road junction, and 200 feet south of Poe Road:

A1—0 to 5 inches, very dark grayish-brown (10YR 3/2) silt loam; moderate, medium, granular structure; friable; many roots; 2 percent coarse fragments; strongly acid; abrupt, irregular boundary.

A2—5 to 9 inches, yellowish-brown (10YR 5/4) silt loam; weak, medium, platy structure; friable; common roots; 2 percent coarse fragments; very strongly acid; clear, wavy boundary.

B1—9 to 14 inches, yellowish-brown (10YR 5/6) heavy silt loam; moderate, medium, subangular blocky structure; friable; common roots; 2 percent coarse fragments; very strongly acid; clear, smooth boundary.

B2t—14 to 21 inches, brown (7.5YR 5/4) silty clay loam; common, fine, distinct, light brownish-gray (10YR 6/2) and yellowish-brown (10YR 5/8) mottles; moderate, medium and coarse, subangular blocky structure; firm; common roots; medium, very patchy, brown (10YR 5/3) clay films in pores and on ped surfaces; 2 percent coarse fragments; very strongly acid; clear, wavy boundary.

Bx1t—21 to 33 inches, dark yellowish-brown (10YR 4/4) clay loam; common, fine, distinct, strong-brown (10YR 5/8) mottles; moderate, very coarse, prismatic structure parting to weak thick platy; very firm; about 60 percent of mass is brittle; few roots along seams; thick, continuous, gray (10YR 6/1) ped coatings; thick, prominent, gray (N 5/0) clay seams; thin, patchy, very dark grayish-brown (2.5Y 3/2) clay films ½ millimeter to 2 millimeters thick on vertical ped surfaces; some clay films as streaks in ped interiors as channel fillings; common, fine, very dark grayish-brown (10YR 3/2) concretions; 5 percent coarse fragments; medium acid; clear, smooth boundary.

Bx2t—33 to 42 inches, dark-brown (10YR 4/3) silty clay (10YR 5/8) mottles; moderate, very coarse, prismatic structure parting to weak, thick, platy; very firm; about 80 percent of mass is brittle; few roots along seams; thick, continuous, gray (10YR 6/1) ped coatings; thick, prominent, gray (N 5/0) clay seams; thin, patchy, grayish-brown (2.5Y 5/2) and very dark grayish-brown (2.5Y 3/2) clay films ½ millimeter thick on vertical ped surfaces; common, fine, very dark grayish-brown (10YR 3/2) concretions; 5 percent coarse fragments; strongly acid; clear, wavy boundary.

C1—42 to 60 inches, dark-brown (10YR 4/3) gravelly loam; common, fine, prominent, gray (N 6/0) mottles; massive; very firm; thin, patchy, gray (10YR 6/1) coatings along fracture planes; thin, very patchy, light-gray (2.5Y 7/2) clay films on surface of fracture planes; 15 percent coarse fragments; moderately alkaline; strong effervescence; gradual boundary.

C2—60 to 80 inches; dark-brown (10YR 4/3) gravelly loam; massive; very firm; common, fine, prominent, gray (N 6/0) streaks and seams along fracture planes; 15 percent coarse fragments; moderately alkaline; strong effervescence.

Sebring silt loam, till substratum (MD–16), in Guilford Township, R. 13 W., 2,300 feet west and 1,000 feet north of Rawiga and Yoder Road junction:

A1—0 to 3 inches, very dark gray (10YR 3/1) silt loam; common, fine, distinct, dark-brown (7.5YR 4/4) mottles; moderate, fine and medium, granular structure; friable; many roots; 1 percent coarse fragments; very strongly acid; clear, wavy boundary.

A2—3 to 9 inches, light brownish-gray (10YR 6/2) silt loam; common, fine, distinct, dark-brown (7.5YR 4/4) mottles; weak, medium, platy structure; friable; common roots; tubular pores and some vesicular pores; 1 percent coarse fragments; strongly acid; clear, wavy boundary.

B1g—9 to 11 inches; gray (2.5Y 6/1) light silty clay loam; many, fine, prominent, brown (7.5YR 5/4) mottles; moderate, fine and medium, subangular blocky structure; friable; common roots; 1 percent coarse fragments; strongly acid; clear, smooth boundary.

B21tg—11 to 16 inches, gray (2.5Y 5/1) light silty clay loam; many, fine, prominent, brown (7.5YR 5/4) mottles on ped interiors and continuous gray (2.5Y 5/1) coatings on ped surfaces; moderate, medium, prismatic structure parting to moderate, medium, subangular blocky; firm; few roots; me-

dium, patchy, gray (2.5Y 5/1) clay films on vertical and horizontal ped surfaces; 1 percent coarse fragments; many, fine, black (5Y 2/2) stains; strongly acid; gradual, wavy boundary.

B22tg—16 to 26 inches, gray (2.5Y 5/1) light silty clay loam; many, fine, prominent, brown (7.5YR 5/4) mottles on ped interiors and continuous gray (2.5Y 5/1) coatings on ped surfaces; moderate, coarse, prismatic structure parting to moderate, coarse, subangular blocky; firm; few roots; medium, patchy, gray (2.5Y 5/1) clay films on vertical and horizontal ped surfaces; 1 percent coarse fragments; many, fine black (5Y 2/2) stains; strongly acid; clear, irregular boundary.

IIB31t—26 to 36 inches, brown (7.5YR 4/4) loam; many, medium, faint, strong-brown (7.5YR 5/6) mottles and many, medium, prominent, gray (2.5Y 5/1) mottles; continuous, gray (N 5/0) coatings on ped surfaces; very coarse, prismatic structure; firm; about 40 percent of mass is brittle; few roots; medium, patchy, gray (2.5Y 5/1) clay films on vertical ped surfaces; 5 percent coarse fragments; common, fine, black (5Y 2/2) stains; medium acid; clear, smooth boundary.

IIB32t—36 to 45 inches, brown (10YR 4/3) silty clay loam; many, medium, prominent, gray (N 5/0) mottles and continuous coatings on ped surfaces; very coarse, prismatic structure; firm; about 25 percent of mass is brittle; few roots; medium, patchy, gray (N 5/0) clay films on vertical surfaces; 1 percent coarse fragments; slightly acid; gradual, wavy boundary.

IIIC1—45 to 66 inches, dark yellowish-brown (10YR 4/4) silt loam; common, fine, distinct, yellowish-brown (10YR 5/6) mottles; massive; firm; 5 percent coarse fragments; neutral; gradual, wavy boundary.

IIIC2—66 to 80 inches, dark-brown (10YR 4/3) silt loam; few, fine, distinct, grayish-brown (10YR 5/2) mottles and streaks; massive; very firm; 8 percent coarse fragments; neutral.

General Nature of the County

This section provides general information about Medina County. It discusses climate and the physiography, relief, and drainage. It also gives facts about farming in the county.

Climate

The climate of Medina County is continental (*17*). It is characterized by large annual and daily differences in temperature. Although the county is less than 30 miles south of Lake Erie, the marine influence of the lake does little to modify the climate of most areas of the county. The summers are moderately warm and humid and have an average of 14 days when the temperature is equal to or greater than 90° F.

Winters are reasonably cold and cloudy and have an average of 6 days when the temperature is below zero. Weather changes occur every few days as a result of the passing of cold or warm fronts and their associated centers of high and low pressure. The daily range in temperature is generally greatest late in summer and is least in winter (table 11).

There is a 50-percent chance of frost as late as May 8 and as early as October 3 each year at the Chippewa Lake weather observation station, which results in a growing season 148 days long.

Precipitation in Medina County varies widely from year to year, but it is normally abundant and well distributed throughout the year. Fall is the driest season. Showers and thunderstorms account for most of the rainfall during the growing season. Soil moisture varies during the year. It is generally lowest in October. This is followed by a recharge period in winter and early in spring. Rainfall is commonly sufficient to meet the needs of crops until July and August, when the need for water for plant growth is great.

Crops that require a large continuous supply of water during July and August quickly deplete the reserve of moisture in the rooting zone of most soils. However, soils that have a deep rooting zone and high available water capacity commonly have an adequate reserve of moisture.

Physiography, Relief, and Drainage

Medina County includes parts of two major physiographic provinces, as defined by Fenneman (*6*). These are the Great Central Lowlands and the glaciated part of the Appalachian Plateau, each of which makes up about half of the county.

The topography generally is mostly nearly level to sloping, but a few steeper slopes are on the sides of major stream valleys. The elevation ranges from about 765 to 1,325 feet above sea level. The highest elevation is about 2 miles east of Hinckley, near the Medina-Summit County line. The lowest elevation is in Liverpool Township, where West Branch of Rocky River leaves Medina County. There is a general rise in elevation from west to east. Local relief, however, commonly varies less than 50 feet per mile.

Most of the soils in Medina County are underlain by glacial drift or till deposits. This glacial drift was deposited about 15,000 to 20,000 years ago by the Wisconsin Glaciation. According to Dr. G. W. White (*18*), the dominant Hiram till, the Mogadore till, and an unnamed till of the Killbuck lobe all occur as surface drift in Medina County. Mahoning and Ellsworth soils are examples of soils that formed in Hiram till; Canfield and Ravenna are examples of soils that formed in Mogadore till; and Rittman and Wadsworth are examples of soils that formed in unnamed till of the Killbuck lobe.

About two-thirds of Medina County drains into Lake Erie mainly by way of Rocky River and East Branch of Black River. The remaining one-third is in the Ohio River watershed. The principal streams that form part of the headwaters of this watershed are Killbuck, Chippewa, Wolf Creek, and River Styx.

Farming

Medina County is well suited to farming. Most of the soils are arable, and large markets are within a distance of about 30 miles. Typically, with good management, the soils are productive and are suited to all the commonly grown crops. Additional information on management is contained in the section, "Use and Management of the Soils."

According to the U.S. Bureau of the Census, in 1969 Medina County had 1,288 farms totaling 144,178 acres, or about 53 percent of the total land area. This is a decrease from the 1964 census figures, which were 1,508 farms, 160,465 acres, and about 59 percent of the total

TABLE 10.—*Laboratory*

[Analyses made by Ohio Agricultural Research and Development Center,

Soil and sample number	Horizon	Depth	Particle-size distribution: Very coarse sand (2 to 1 mm)	Coarse sand (1 to 0.5 mm)	Medium sand (0.5 to 0.25 mm)	Fine sand (0.25 to 0.10 mm)	Very fine sand (0.10 to 0.05 mm)	Total sand (2.0 to 0.05 mm)	Silt (0.05 to 0.002 mm)	Clay (less than 0.002 mm) [1]	Fine clay (less than 0.0002 mm) [1]
		In	*Pct*	*Pct*	*Pct*	*Pct*	*Pct*	*Pct*	*Pct*	*Pct*	*Pct*
Bennington silt loam, MD-20.	Ap	0–9	0.4	1.9	1.8	4.8	2.4	11.3	66.4	22.3	5.4
	A2	9–11	0.5	1.5	1.4	3.1	1.1	7.6	68.5	23.9	11.2
	B21t	11–17	0.7	1.5	1.3	3.3	1.0	7.8	51.6	40.6	25.7
	B22t	17–28	1.1	2.5	2.5	6.9	4.9	17.9	44.2	37.9	16.1
	C	28–38	2.4	3.0	2.6	8.6	4.4	21.0	49.2	29.8	7.6
	C	38–48	2.2	3.1	2.1	7.0	4.2	18.6	50.5	30.9	7.7
	C	48–60	2.6	3.8	2.4	7.5	4.3	20.6	50.6	28.8	8.1
Cardington silt loam, MD-19.	Ap	0–8	0.7	3.3	3.6	10.3	7.5	25.4	60.7	13.9	3.7
	B1	8–12	1.8	3.0	2.8	8.0	5.6	21.2	50.7	28.1	10.6
	B21t	12–17	1.0	2.5	2.5	7.2	5.3	18.5	46.8	34.7	14.2
	B22t	17–28	1.5	2.5	2.5	7.1	4.9	18.5	45.1	36.4	17.4
	B3t	28–32	1.2	2.3	2.1	7.0	6.4	19.0	49.2	31.8	10.6
	C	32–40	1.5	2.7	2.1	6.8	6.2	19.3	51.4	29.3	8.5
	C	40–50	1.5	2.7	2.5	7.7	7.1	21.5	51.5	27.0	7.4
	C	50–60	1.1	2.4	2.3	8.2	4.1	18.1	51.9	30.0	8.3
	C	60–75	1.7	3.4	2.4	7.2	4.3	19.0	52.0	29.0	10.0
Fitchville silt loam, MD-21.	Ap	0–9	4.4	4.5	3.0	11.3	5.5	28.7	54.0	17.3	4.6
	A2	9–11	1.6	3.1	2.6	12.1	6.5	25.9	54.8	19.3	6.5
	B21tg	11–15	0.9	2.4	2.6	11.6	6.3	23.8	52.2	24.0	9.7
	B22tg	15–23	1.1	2.5	1.9	7.6	4.5	17.6	53.9	28.5	14.0
	B23tg	23–30	0.5	1.9	2.1	7.9	4.6	17.0	55.2	27.8	13.2
	B24tg	30–38	1.5	3.8	3.4	12.9	7.3	28.9	47.5	23.6	11.0
	B3g	38–50	3.0	5.8	3.9	14.7	8.7	36.1	46.3	17.6	8.7
	IIC	50–70	5.9	7.0	5.6	33.6	6.6	58.7	21.3	20.0	9.8
Mahoning silt loam, MD-14.	Ap	0–9	1.4	2.7	2.7	6.2	6.6	19.6	58.9	21.5	2.3
	B21t	9–14	0.7	1.6	1.8	4.3	5.1	13.5	51.6	34.9	10.9
	B22t	14–22	1.1	2.4	1.8	4.4	5.6	15.3	47.0	37.7	12.5
	B23t	22–30	1.8	2.7	1.8	4.4	5.6	16.3	48.4	35.3	10.7
	B3t	30–34	2.0	2.9	1.9	4.3	5.6	16.7	50.8	32.5	9.7
	C1	34–45	1.6	2.6	2.0	4.7	5.8	16.7	51.3	32.0	9.7
	C2	45–55	1.1	1.4	0.9	2.0	2.3	7.7	55.8	36.5	8.6
	C2	55–67	3.0	3.7	2.2	4.7	5.5	19.1	52.8	28.1	6.4
Rittman silt loam, MD-18.	A1	0–5	1.5	2.4	1.4	5.5	8.7	19.5	61.5	19.0	4.4
	A2	5–9	1.3	2.2	1.6	5.4	8.3	18.8	66.3	14.9	2.5
	B1	9–14	0.5	0.9	0.8	3.4	6.9	12.5	62.0	25.5	8.3
	B2t	14–21	0.7	1.0	0.8	3.6	6.6	12.9	54.4	32.7	15.2
	Bx1t	21–33	2.1	2.7	2.1	6.8	7.0	20.7	48.6	30.7	10.5
	Bx2t	33–42	1.9	2.5	2.0	6.9	6.5	19.8	48.7	31.5	11.1
	C1	42–60	2.9	3.7	2.6	7.9	7.5	24.6	49.1	26.3	6.8
	C2	60–80	2.8	3.7	2.4	7.6	7.6	24.1	49.4	26.5	6.6
Sebring silt loam, till substratum, MD-16.	A1	0–3	1.6	0.8	0.5	0.7	1.9	5.5	74.1	20.4	6.0
	A2	3–9	1.3	2.4	1.4	4.3	9.0	18.4	64.5	17.1	4.2
	B1g	9–11	0.3	0.8	0.8	2.7	6.6	11.2	61.7	27.1	10.3
	B21tg	11–16	0.5	0.8	0.5	2.4	7.5	11.7	56.6	31.7	15.2
	B22tg	16–26	0.8	1.2	1.2	4.4	8.8	16.4	52.2	31.4	15.0
	IIB31t	26–36	3.9	3.5	2.5	6.8	9.6	26.3	48.7	25.0	11.7
	IIB32t	36–45	0.9	1.5	0.8	2.1	0.9	6.2	55.9	37.9	11.2
	IIIC1	45–66	4.0	4.0	2.7	11.3	8.2	30.2	50.6	19.2	4.6
	IIIC2	66–80	3.7	3.0	1.6	4.8	8.2	21.3	53.8	24.9	5.6
Wadsworth silt loam, MD-13.	Ap	0–5	1.3	1.7	1.5	3.8	5.7	14.0	67.0	19.0	5.1
	A2	5–9	1.6	2.0	1.4	3.9	8.4	17.3	62.1	20.6	4.7
	B1	9–15	2.2	2.3	1.5	4.2	9.2	19.4	52.7	27.9	9.8
	B2t	15–21	1.9	2.4	1.4	3.8	7.6	17.1	52.2	30.7	12.0
	Bx1t	21–28	2.4	2.7	1.8	5.3	8.2	20.4	50.5	29.1	10.1
	Bx1t	28–36	3.5	2.7	1.7	5.1	8.9	21.9	50.6	27.5	9.7
	Bx2t	36–44	2.8	3.6	2.2	6.0	9.9	24.5	50.0	25.5	9.1
	Bx2t	44–52	3.5	3.7	2.1	5.8	9.2	24.3	50.3	25.4	7.8
	C1	52–70	5.4	4.6	2.2	5.7	9.1	27.0	50.4	22.6	6.5
	C2	70–80	3.7	3.7	2.0	5.1	8.5	23.0	52.6	24.4	6.7

data

Columns, Ohio. Dashes indicate that no determination was made]

USDA textural class	Reaction (1:1 H_2O)	Organic matter content	Calcium carbonate equivalent	Extractable cations (milliequivalents per 100 grams of soil): Hydrogen	Calcium	Magnesium	Potassium	Sum of extractable cations	Sum of bases	Base saturation (sum)
	pH	*Pct*								*Pct*
Silt loam	6.0	2.91	----	9.3	7.1	1.5	0.15	18.8	8.8	48
Silt loam	5.2	1.62	----	9.1	7.3	2.2	.21	18.8	9.7	52
Silty clay	4.8	.93	----	12.3	11.5	3.5	.40	27.7	15.4	56
Silty clay loam	6.2	.72	----	4.6	12.9	3.8	.26	21.6	17.0	79
Clay loam	7.8	----	12.3	----	----	----	----	----	----	----
Silty clay loam	7.8	----	14.8	----	----	----	----	----	----	----
Clay loam	7.7	----	13.5	----	----	----	----	----	----	----
Silt loam	6.2	2.18	----	6.4	5.0	2.2	.12	13.7	7.3	53
Clay loam	5.6	.89	----	8.3	5.1	1.9	.15	15.4	7.1	46
Silty clay loam	4.9	.86	----	10.7	6.3	2.4	.20	19.6	8.9	45
Silty clay loam	5.6	.86	----	6.0	9.5	3.4	.21	19.1	13.1	69
Silty clay loam	7.6	----	0.6	----	----	----	----	----	----	----
Silty clay loam	7.8	----	7.0	----	----	----	----	----	----	----
Clay loam	7.8	----	6.8	----	----	----	----	----	----	----
Silty clay loam	7.9	----	8.8	----	----	----	----	----	----	----
Silty clay loam	8.0	----	8.9	----	----	----	----	----	----	----
Silt loam	6.7	3.03	----	6.3	7.6	2.3	.27	16.5	10.2	62
Silt loam	5.9	.69	----	4.5	3.3	1.6	.16	9.6	5.1	53
Silt loam	4.9	.55	----	7.1	3.4	1.7	.17	12.4	5.3	43
Silty clay loam	4.8	.52	----	9.4	4.3	2.2	.25	16.1	6.8	42
Silty clay loam	4.8	.41	----	9.2	4.1	3.1	.24	16.6	7.4	45
Loam	4.8	.41	----	7.3	3.3	2.8	.17	13.6	6.3	46
Loam	5.0	.38	----	5.3	3.6	2.7	.15	11.8	6.4	55
Fine sandy loam	5.7	.41	----	3.6	4.4	2.5	.15	10.6	7.0	66
Silt loam	5.1	3.10	----	11.4	4.5	0.9	.22	17.0	5.6	33
Silty clay loam	4.9	.86	----	12.1	3.8	0.8	.20	16.9	4.8	28
Silty clay loam	4.9	.69	----	11.8	5.6	2.7	.23	20.3	8.5	42
Silty clay loam	6.5	.52	----	3.9	10.0	4.2	.22	18.3	14.4	79
Silty clay loam	7.6	----	2.0	----	----	----	----	----	----	----
Silty clay loam	7.9	----	9.2	----	----	----	----	----	----	----
Silty clay loam	8.0	----	15.9	----	----	----	----	----	----	----
Silty clay loam	8.0	----	15.2	----	----	----	----	----	----	----
Silt loam	5.1	6.36	----	17.4	3.5	1.1	.45	22.5	5.0	22
Silt loam	4.9	2.24	----	12.0	1.4	0.7	.20	14.3	2.3	16
Silt loam	4.6	.86	----	13.4	1.8	1.1	.16	16.5	3.1	19
Silty clay loam	4.6	.86	----	16.4	3.1	1.6	.24	21.3	4.9	23
Clay loam	5.7	.69	----	6.4	7.7	3.4	.17	17.7	11.3	64
Silty clay loam	5.5	.52	----	7.8	7.0	3.2	.23	18.2	10.4	57
Loam	8.0	----	5.9	----	----	----	----	----	----	----
Loam	8.1	----	6.6	----	----	----	----	----	----	----
Silt loam	5.0	8.26	----	18.1	5.5	2.5	.60	26.7	8.6	32
Silt loam	5.3	1.20	----	7.3	2.6	1.2	.15	11.2	3.9	35
Silty clay loam	5.2	.86	----	8.3	5.3	2.5	.25	16.3	8.0	49
Silty clay loam	5.1	.69	----	8.5	8.1	3.9	.40	20.9	12.4	59
Silty clay loam	5.4	.52	----	7.1	8.6	4.3	.38	20.4	13.3	65
Loam	5.7	.52	----	6.0	8.1	3.9	.31	18.3	12.3	67
Silty clay loam	6.4	.69	----	4.7	10.0	4.5	.26	19.5	14.8	76
Silt loam	7.0	.69	----	2.5	5.9	2.5	.13	11.0	8.5	77
Silt loam	7.1	.69	----	2.8	7.0	2.5	.17	12.5	9.7	78
Silt loam	4.9	4.99	----	15.2	3.6	0.6	.40	19.8	4.6	23
Silt loam	5.0	1.20	----	9.4	3.1	0.7	.15	13.3	3.9	30
Silty clay loam	4.8	.52	----	11.5	2.7	0.7	.18	15.1	3.6	24
Silty clay loam	4.7	.52	----	12.6	3.6	1.1	.20	17.5	4.9	28
Clay loam	5.0	.52	----	8.3	5.2	2.4	.18	16.1	7.8	48
Clay loam	6.0	.52	----	2.9	8.2	3.2	.18	14.5	11.6	80
Silt loam	6.5	.34	----	4.3	8.2	3.4	.15	16.1	11.8	73
Silt loam	7.3	----	1.6	----	----	----	----	----	----	----
Silt loam	7.9	----	3.9	----	----	----	----	----	----	----
Silt loam	7.9	----	2.9	----	----	----	----	----	----	----

TABLE 10.—*Laboratory*

Soil and sample number	Horizon	Depth	Particle-size distribution								
			Very coarse sand (2 to 1 mm)	Coarse sand (1 to 0.5 mm)	Medium sand (0.5 to 0.25 mm)	Fine sand (0.25 to 0.10 mm)	Very fine sand (0.10 to 0.05 mm)	Total sand (2.0 to 0.05 mm)	Silt (0.05 to 0.002 mm)	Clay (less than 0.002 mm) [1]	Fine clay (less than 0.0002 mm) [1]
Willette muck, MD-22.	Oa1	0-7	--------	--------	--------	--------	--------	--------	--------	--------	--------
	Oa2	7-15	--------	--------	--------	--------	--------	--------	--------	--------	--------
	Oa3	15-24	--------	--------	--------	--------	--------	--------	--------	--------	--------
	Oa4	24-30	--------	--------	--------	--------	--------	--------	--------	--------	--------
	Oa5	30-36	0.6	1.4	0.8	1.7	1.1	5.6	58.3	36.1	5.9
	IIC1	36-46	0.2	0.1	0.0	0.2	0.8	1.3	63.7	35.0	14.1
	IIC2	46-60	0.2	0.8	0.7	3.5	3.4	8.6	63.9	27.5	10.5

[1] The percentage tabulated for clay includes the percentage for fine clay.

land area. This decrease of land in farms is the result of increased strip development along several of the roadways, increased community development, more recreational facilities, and highway construction. The average size of farms has increased from about 106 acres in 1964 to 112 acres in 1969. This increase has been caused by economic conditions and the increased use of modern farm equipment.

In 1969 dairying was the leading source of farm income, but greenhouse and nursery stock, general livestock and farm crops, and fruit and forest products were also important.

The principal kinds of livestock on farms in Medina County in 1969 were as follows: 21,768 cattle and calves; 9,362 milk cows; 7,881 hogs and pigs; 3,591 sheep and lambs; 1,617 horses and ponies; and 134,177 chickens (3 months old or older).

Acreages of the principal crops harvested in 1969 were as follows: corn (all purposes), 19,997 acres; wheat, 6,186 acres; other small grain, 7,623 acres; soybeans, 5,966 acres; and hay (excluding sorghum hay), 34,537 acres.

The overall trend on farms in the county is toward greater mechanization and efficiency. In the last two decades, crop yields per acre have about doubled.

Literature Cited

(1) Allan, P. F., L. E. Garland, and R. Dugan. 1963. Rating northeastern soils for their suitability for wildlife habitat. 28th North Am. Wildl. and Nat. Resour. Conf. Wildl. Manage. Inst., pp. 247-261, illus.

(2) American Society for Testing and Materials. 1974. Method for classification of soils for engineering purposes. ASTM Stand. D 2487-69. *In* 1974 Annual Book of ASTM Standards, Part 19, 464 pp., illus.

(3) American Association of State Highway [and Transportation] Officials. 1970. Standard specifications for highway materials and methods of sampling and testing. Ed. 10, 2 vol., illus.

(4) Curtis, R. O., and B. W. Post. 1962. Site index curves for even-aged northern hardwoods in the Green Mountains of Vermont, Vt. Agric. Exp. Sta. Bull. 629.

(5) Dreimanis, A. 1962. Quantitative gasometric determination of calcite and dolomite by using the Chittick apparatus. J. Sediment. Petrol., vol. 32, 3: pp. 520-529, illus.

(6) Fenneman, Nevin M. 1938. Physiography of eastern United States. 714 pp. illus.

(7) Lloyd, William J. 1970. White pine yield tables (adaptions from Frothingham, 1914, and Barrett and Allen, 1966). Tech. Note UD-6, U.S. Dep. Agric., Soil Cons. Serv.

(8) McCarthy, Edward Florince. 1933. Yellow poplar characteristics, growth and management. U.S. Dep. Agric. Tech. Bull. 356, 58 pp., illus.

(9) Ohio Soil and Water Conservation Needs Inventory. 1971. Sponsored by the U.S. Dep. Agric. Publ. by the Ohio Soil and Water Conserv. Needs Comm., Columbus, Ohio.

(10) Peech, Michael, L. T. Alexander, L. A. Dean, and J. F. Reed. 1947. Methods of soil analysis for soil-fertility investigations. U.S. Dep. Agric. Circ. 757, 25 pp.

(11) Ritchie, A., L. P. Wilding, G. F. Hall, and C. R. Stahnke, 1974. Genetic implications of B horizons in northeastern Ohio. Soil Sci. Soc. of Amer. Proc., vol 38, No. 2, pp. 351-358.

(12) Schnur, G. Luther. 1937. Yield, stand, and volume tables for even-aged upland oak forests. U.S. Dep. Agric. Tech. Bull. 560, 88 pp., illus. [Reprinted in 1961]

(13) Simonson, Roy W. 1959. Outline of a generalized theory of soil genesis. Soil Sci. Soc. Am. Proc. 23: pp. 152-156, illus.

(14) Steele, J. G., and Bradfield, R. 1934. Significance of size distribution in the clay fraction. Amer. Soil Surv. Assoc. Bull. 15, pp. 88-93.

(15) United States Department of Agriculture. 1951. Soil survey manual. U.S. Dep. Agric. Handb. 18, 503 pp., illus. [Supplements replacing pp. 173-188 issued May 1962]

(16) ———— 1960. Soil classification, a comprehensive system, 7th approximation. 265 pp., illus. [Supplements issued in March 1967 and September 1968]

(17) United States Department of Commerce. 1968. Climatography of the United States. Environ. Sci. Serv. Admin., No. 20-33-46, 2 pp., illus.

(18) White, George W. 1960. Classification of Wisconsin glacial deposits in northeastern Ohio. U.S. Geol. Surv. Bull. 1121-A, pp. A-3.

Glossary

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as crumbs, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvium. Soil material, such as sand, silt, or clay, that has been deposited on land by streams.

Available water capacity (also termed available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil.

data—Continued

USDA textural class	Reaction (1:1 H_2O)	Organic matter content	Calcium carbonate equivalent	Extractable cation (milliequivalents per 100 grams of soil)						Base saturation (sum)
				Hydrogen	Calcium	Magnesium	Potassium	Sum of extractable cations	Sum of bases	
Muck	5.4	58.74	--------	49.7	60.4	6.4	2.30	118.8	69.1	58
Muck	5.5	56.69		44.8	61.4	1.3	1.75	109.3	64.5	59
Muck	4.0	67.97	--------	60.3	31.6	3.0	1.61	96.5	36.2	38
Muck	3.8	41.33	--------	59.2	28.4	2.6	.82	91.0	31.8	35
Silty clay loam	4.2	35.67	--------	47.2	28.2	3.3	.71	79.4	32.2	41
Silty clay loam	4.2	2.89	--------	13.6	18.0	3.5	.44	35.5	21.9	62
Silty clay loam	5.6	2.43	--------	7.0	12.0	3.9	.29	23.2	16.2	70

Base saturation. The degree to which material that has base-exchange properties is saturated with exchangeable cations other than hydrogen, expressed as a percentage of the cation-exchange capacity.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of clay on the surface of a soil aggregate. Synonyms: clay coat, clay skin.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrations of compounds, or of soil grains cemented together. The composition of some concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are examples of material commonly found in concretions.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material, and tends to stretch somewhat and pull apart, rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard and brittle; little affected by moistening.

Eluviation. The movement of material from one place to another within the soil, in either true solution or colloidal suspension. Soil horizons that have lost material through eluviation are said to be eluvial; those that have received material are illuvial.

Esker (geology). A narrow, winding ridge or mound of stratified gravelly and sandy drift that was deposited by a subglacial stream.

Flood plain. Nearly level land, consisting of stream sediments, that borders a stream and is subject to flooding unless protected artificially.

Fragipan. A loamy, brittle, subsurface horizon that is very low in organic-matter content and clay but is rich in silt or very fine sand. The layer is seemingly cemented. When dry, it is hard or very hard and has a high bulk density in comparison with the horizon or horizons above it. When moist, the fragipan tends to rupture suddenly if pressure is applied, rather than to deform slowly. The layer is generally mottled, is slowly or very slowly permeable to water, and has few or many bleached fracture planes that form polygons. Fragipans are a few inches to several feet thick; they generally occur below the B horizon, 15 to 40 inches below the surface.

Glacial drift (geology). Rock material transported by glacial ice and then deposited; also includes the assorted and unassorted materials deposited by streams flowing from glaciers.

Glacial outwash (geology). Cross-bedded gravel, sand, and silt deposited by melt-water as it flowed from glacial ice.

Glacial till (geology). Unassorted, nonstratified glacial drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice.

Horizon, soil. A layer of soil, approximately parallel to the surface, that has distinct characteristics produced by soil-forming processes. These are the major horizons:

O horizon.—The layer of organic matter on the surface of a mineral soil. This layer consists of decaying plant residues.

A horizon.—The mineral horizon at the surface or just below an O horizon. This horizon is the one in which living organisms are most active and therefore is marked by the accumulation of humus. The horizon may have lost one or more of soluble salts, clay, and sesquioxides (iron and aluminum oxides).

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of change from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics caused (1) by accumulation of clay, sesquioxides, humus, or some combination of these; (2) by prismatic or blocky structure; (3) by redder or stronger colors than the A horizon; or (4) by some combination of these. Combined A and B horizons are usually called the solum, or true soil. If a soil lacks a B horizon, the A horizon alone is the solum.

C horizon.—The weathered rock material immediately beneath the solum. In most soils this material is presumed to be like that from which the overlying horizons were formed. If the material is known to be different from that in the solum, a Roman numeral precedes the letter C.

R layer.—Consolidated rock beneath the soil. The rock usually underlies a C horizon but may be immediately beneath an A or B horizon.

Illuviation. The accumulation of material in a soil horizon through the deposition of suspended material and organic matter removed from horizons above. Since part of the fine clay in the B horizon (or subsoil) of many soils has moved into the B horizon from the A horizon above, the B horizon is called an illuvial horizon.

Kame (geology). An irregular, short ridge or hill of stratified glacial drift.

TABLE 11.—*Temperature and precipitation*

[Data recorded at Chippewa Lake; period of record 1936–65]

Month	Temperature			Precipitation	
	Mean daily maximum	Mean daily minimum	Mean	Mean total	Mean total snow and sleet
	°F	*°F*	*°F*	*Inches*	*Inches*
January	35.2	18.6	26.9	2.76	8.8
February	37.9	19.5	28.7	2.46	8.8
March	47.1	26.7	36.9	3.19	8.5
April	60.2	36.3	48.2	3.66	1.9
May	71.7	46.4	59.0	3.91	0
June	80.4	55.3	67.8	4.22	0
July	83.9	58.4	71.1	3.93	0
August	82.7	57.2	69.9	3.05	0
September	76.8	50.8	63.8	2.74	0
October	65.8	41.2	53.5	2.50	.2
November	50.2	31.7	40.9	2.52	3.7
December	38.0	22.1	30.0	2.28	7.9
Year	60.8	38.6	49.7	37.22	39.8

Lacustrine deposit (geology). Material deposited in lake water and exposed by lowering of the water level or elevation of the land.

Leaching. The removal of soluble materials from soils or other material by percolating water.

Loess. Fine-grained material, dominantly of silt-sized particles, that has been deposited by wind.

Moraine (geology). An accumulation of earth, stones, and other debris deposited by a glacier. Types are these: Terminal, lateral, medial, ground.

Mottling, soil. Irregularly marked with spots of different colors that vary in number and size. Mottling in soils usually indicates poor aeration and lack of drainage. Descriptive terms are as follows: abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrasts—*faint, distinct,* and *prominent.* The size measurements are these: *fine,* less than 5 millimeters (about 0.2 inch) in diameter along the greatest dimension; *medium,* ranging from 5 millimeters to 15 millimeters (about 0.2 to 0.6 inch) in diameter along the greatest dimension; and *coarse,* more than 15 millimeters (about 0.6 inch) in diameter along the greatest dimension.

Muck. An organic soil consisting of fairly well decomposed organic material that is relatively high in mineral content, finely divided, and dark in color.

Munsell notation. A system for designating color by degrees of the three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with a hue of 10YR, a value of 6, and a chroma of 4.

Natural soil drainage. Refers to the conditions of frequency and duration of periods of saturation or partial saturation that existed during the development of the soil, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven different classes of natural soil drainage are recognized.

Excessively drained soils are commonly very porous and rapidly permeable and have a low available water capacity.

Somewhat excessively drained soils are also very permeable and are free from mottling throughout their profile.

Well-drained soils are nearly free from mottling and are commonly of intermediate texture.

Moderately well drained soils commonly have a slowly permeable layer in or immediately beneath the solum. They have uniform color in the A and upper B horizons and mottling in the lower B and the C horizons.

Somewhat poorly drained soils are wet for significant periods but not all the time, and some soils commonly have mottling at a depth below 6 to 16 inches.

Poorly drained soils are wet for long periods and are light gray and generally mottled from the surface downward, although mottling may be absent or nearly so in some soils.

Very poorly drained soils are wet nearly all the time. They have a dark-gray or black surface layer and are gray or light gray, with or without mottling, in the deeper parts of the profile.

Organic matter. A general term for plant and animal material, in or on the soil, in all stages of decomposition. Readily decomposed organic matter is often distinguished from the more stable forms that are past the stage of rapid decomposition.

Parent material. Disintegrated and partly weathered rock from which soil has formed.

Ped. An individual natural soil aggregate, such as a crumb, a prism, or a block, in contrast to a clod.

Permeability. The quality that enables the soil to transmit water or air. Terms used to describe permeability are as follows: *very slow, slow, moderately slow, moderate, moderately rapid, rapid,* and *very rapid.*

Reaction, soil. The degree of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is precisely neutral in reaction because it is neither acid nor alkaline. An acid, or "sour," soil is one that gives an acid reaction; an alkaline soil is one that is alkaline in reaction. In words, the degrees of acidity or alkalinity are expressed thus:

	pH		*pH*
Extremely acid	Below 4.5	Neutral	6.6 to 7.3
Very strongly acid	4.5 to 5.0	Mildly alkaline	7.4 to 7.8
Strongly acid	5.1 to 5.5	Moderately alkaline	7.9 to 8.4
Medium acid	5.6 to 6.0	Strongly alkaline	8.5 to 9.0
Slightly acid	6.1 to 6.5	Very strongly alkaline	9.1 and higher

Runoff (hydraulics). The part of the precipitation upon a drainage area that is discharged from the area in stream channels. The water that flows off the land surface without sinking in is called surface runoff; that which enters the ground before reaching surface streams is called groundwater runoff or seepage flow from ground water.

Sand. Individual rock or mineral fragments in a soil that range in diameter from 0.05 to 2.0 millimeters. Most sand grains consist of quartz, but they may be of any mineral composition. The textural class name of any soil that contains 85 percent or more sand and not more than 10 percent clay.

Silt. Individual mineral particles in a soil that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). Soil of the silt textural class is 80 percent or more silt and less than 12 percent clay.

Soil. A natural, three-dimensional body on the earth's surface that supports plants and that has properties resulting from

the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Solum. The upper part of a soil profile, above the parent material, in which the processes of soil formation are active. The solum in mature soil includes the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and other plant and animal life characteristic of the soil are largely confined to the solum.

Structure, soil. The arrangement of primary soil particles into compound particles or clusters that are separated from adjoining aggregates and have properties unlike those of an equal mass of unaggregated primary soil particles. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles) adhering together without any regular cleavage, as in many claypans and hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Substratum. Technically, the part of the soil below the solum.

Surface layer. A term used in nontechnical soil descriptions for one or more layers above the subsoil. Includes A horizon and part of B horizon; has no depth limit.

Terrace (geological). An old alluvial plain, ordinarily flat or undulating, bordering a river, lake, or the sea. Stream terraces are frequently called second bottoms, as contrasted to flood plains, and are seldom subject to overflow. Marine terraces were deposited by the sea and are generally wide.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Tilth, soil. The condition of the soil in relation to the growth of plants, especially soil structure. Good tilth refers to the friable state and is associated with high noncapillary porosity and stable, granular structure. A soil in poor tilth is nonfriable, hard, nonaggregated, and difficult to till.

Upland (geology). Land consisting of material unworked by water in recent geologic time and lying, in general, at a higher elevation than the alluvial plain or stream terrace. Land above the lowlands along rivers.

Weathering. All physical and chemical changes produced in rocks at or near the earth's surface by atmospheric agents. These changes result in more or less complete disintegration and decomposition of the rock.

GUIDE TO MAPPING UNITS

For complete information about a mapping unit, read both the description of the mapping unit and that of the soil series to which it belongs. In referring to a capability unit, read the introduction to the section it is in for general information about its management.

Map symbol	Mapping unit	Page	Capability unit Symbol	Capability unit Page	Woodland suitability group Symbol
BnA	Bennington silt loam, 0 to 2 percent slopes	67	IIw-3	9	2w3
BnB	Bennington silt loam, 2 to 6 percent slopes	67	IIw-3	9	2w3
BoA	Bennington-Tiro silt loams, 0 to 2 percent slopes	67	IIw-3	9	2w3
BrF	Berks silt loam, 25 to 70 percent slopes	68	VIIe-1	14	4f1
BtA	Bogart loam, 0 to 2 percent slopes	69	IIs-1	10	2o1
BtB	Bogart loam, 2 to 6 percent slopes	69	IIe-1	7	2o1
Ca	Canadice silty clay loam	70	IVw-1	14	2w2
CcA	Caneadea silt loam, 0 to 2 percent slopes	70	IIIw-4	12	2w3
CcB	Caneadea silt loam, 2 to 6 percent slopes	71	IIIw-4	12	2w3
CdA	Canfield silt loam, 0 to 2 percent slopes	72	IIw-3	9	1o1
CdB	Canfield silt loam, 2 to 6 percent slopes	72	IIe-3	8	1o1
CdB2	Canfield silt loam, 2 to 6 percent slopes, moderately eroded	72	IIe-3	8	1o1
CdC2	Canfield silt loam, 6 to 12 percent slopes, moderately eroded	72	IIIe-1	10	1o1
CeC	Canfield-Urban land complex, rolling	72	-------	--	---
CfB	Cardington fine sandy loam, 2 to 6 percent slopes	73	IIe-3	8	2o1
CgB	Cardington silt loam, 2 to 6 percent slopes	74	IIe-3	8	2o1
CgC2	Cardington silt loam, 6 to 12 percent slopes, moderately eroded	74	IIIe-1	10	2o1
CgE2	Cardington silt loam, 12 to 25 percent slopes, moderately eroded	74	IVe-3	13	2r1
Ch	Carlisle muck	75	IIIw-3	12	5w1
Cm	Chagrin silt loam	76	IIw-2	9	1o1
CnA	Chili loam, 0 to 2 percent slopes	76	IIs-1	10	2o1
CnB	Chili loam, 2 to 6 percent slopes	76	IIe-1	7	2o1
CnC	Chili loam, 6 to 12 percent slopes	77	IIIe-2	11	2o1
CoC2	Chili gravelly loam, 6 to 12 percent slopes, moderately eroded	77	IIIe-2	11	2o1
CoE2	Chili gravelly loam, 12 to 25 percent slopes, moderately eroded	77	IVe-2	13	2r1
CoF2	Chili gravelly loam, 25 to 70 percent slopes, moderately eroded	77	VIIe-2	14	2r2
CpA	Chili silt loam, 0 to 2 percent slopes	77	IIs-1	10	2o1
CpB	Chili silt loam, 2 to 6 percent slopes	77	IIe-1	7	2o1
CpC	Chili silt loam, 6 to 12 percent slopes	78	IIIe-2	11	2o1
CuB	Chili-Urban land complex, undulating	78	-------	--	---
Cy	Condit silt loam	79	IIIw-2	12	2w2
ElB	Ellsworth silt loam, 2 to 6 percent slopes	80	IIIe-1	10	3o1
ElB2	Ellsworth silt loam, 2 to 6 percent slopes, moderately eroded	80	IIIe-1	10	3o1
ElC	Ellsworth silt loam, 6 to 12 percent slopes	80	IVe-1	13	3o1
ElC2	Ellsworth silt loam, 6 to 12 percent slopes, moderately eroded	80	IVe-1	13	3o1
ElE2	Ellsworth silt loam, 12 to 25 percent slopes, moderately eroded	80	VIe-1	14	3r1
ElF	Ellsworth silt loam, 25 to 70 percent slopes	81	VIIe-2	14	3r2
EsB	Ellsworth silt loam, sandstone substratum, 2 to 6 percent slopes	81	IIIe-1	10	3o1
EsC2	Ellsworth silt loam, sandstone substratum, 6 to 12 percent slopes, moderately eroded	81	IVe-1	13	3o1
EuB	Ellsworth-Urban land complex, undulating	81	-------	--	---
FcA	Fitchville silt loam, 0 to 2 percent slopes	82	IIw-4	9	2w3
FcB	Fitchville silt loam, 2 to 6 percent slopes	82	IIw-4	9	2w3
FlA	Fitchville silt loam, low terrace, 0 to 2 percent slopes	83	IIw-1	8	2w3
GbC	Geeburg silt loam, 6 to 18 percent slopes	83	VIe-1	14	2c1
GfA	Glenford silt loam, 0 to 2 percent slopes	84	I-1	7	1o1
GfB	Glenford silt loam, 2 to 6 percent slopes	84	IIe-2	8	1o1
GfC2	Glenford silt loam, 6 to 12 percent slopes, moderately eroded	85	IIIe-2	11	1o1

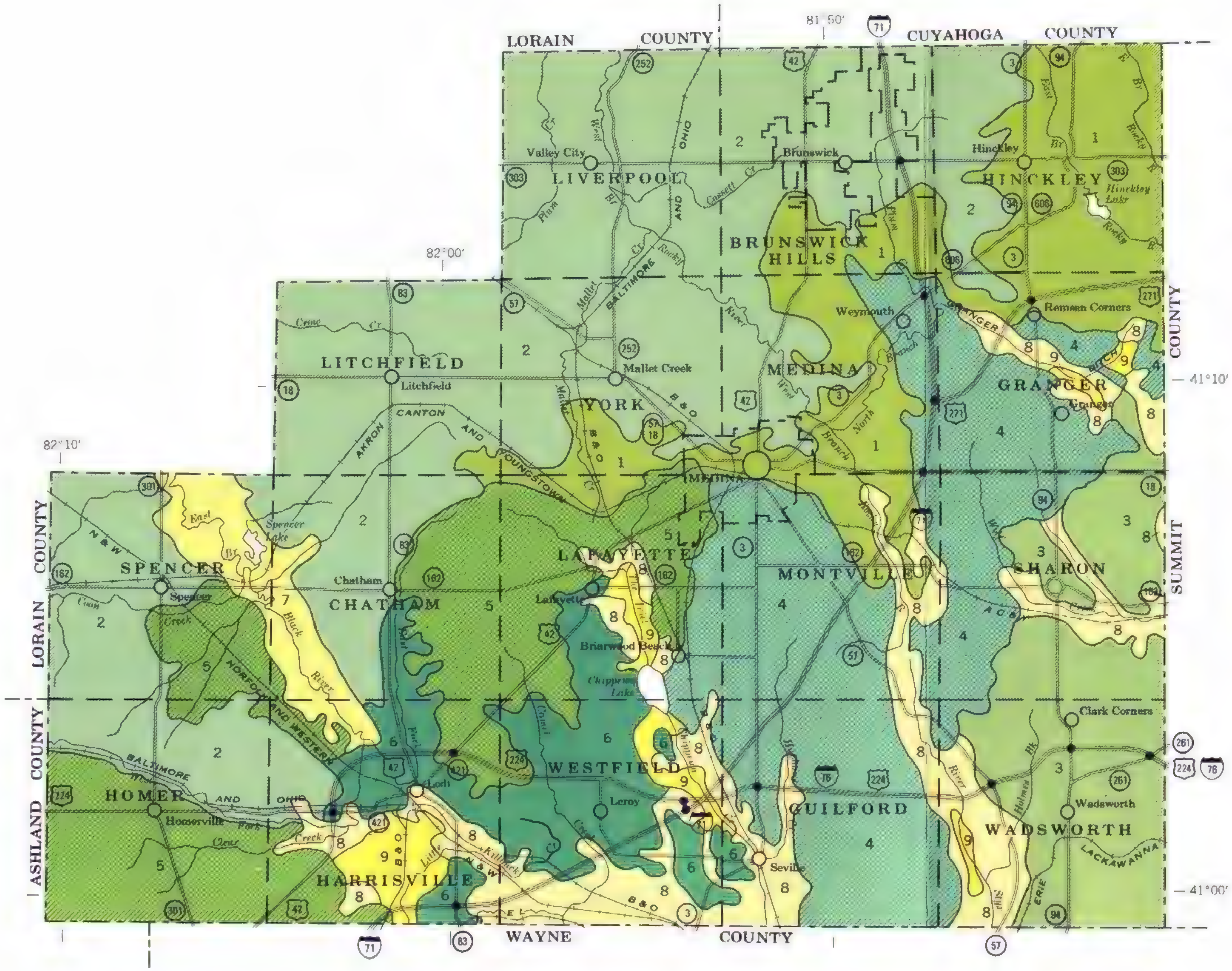
Map symbol	Mapping unit	Page	Capability unit Symbol	Capability unit Page	Woodland suitability group Symbol
HsA	Haskins loam, 0 to 2 percent slopes	85	IIw-3	9	2w3
HsB	Haskins loam, 2 to 6 percent slopes	86	IIw-3	9	2w3
Hy	Holly silt loam	86	IIIw-2	12	2w1
JtA	Jimtown loam, 0 to 2 percent slopes	87	IIw-4	9	2w3
JtB	Jimtown loam, 2 to 6 percent slopes	87	IIw-4	9	2w3
Ju	Jimtown-Urban land complex	87	-------	--	---
Ld	Linwood muck	89	IIw-6	10	5w1
Le	Lobdell silt loam	89	IIw-2	9	1o1
Ln	Lorain silty clay loam	90	IIIw-1	11	2w1
LoB	Loudonville silt loam, 2 to 6 percent slopes	91	IIe-4	8	2o1
LoC	Loudonville silt loam, 6 to 12 percent slopes	91	IIIe-3	11	2o1
LoC2	Loudonville silt loam, 6 to 12 percent slopes, moderately eroded	91	IIIe-3	11	2o1
LoE2	Loudonville silt loam, 12 to 25 percent slopes, moderately eroded	91	IVe-4	14	2r1
Ly	Luray silt loam	92	IIw-5	10	2w1
MgA	Mahoning silt loam, 0 to 2 percent slopes	93	IIIw-4	12	2w3
MgB	Mahoning silt loam, 2 to 6 percent slopes	93	IIIw-4	12	2w3
MlA	Mahoning silt loam, sandstone substratum, 0 to 2 percent slopes	93	IIIw-4	12	2w3
MlB	Mahoning silt loam, sandstone substratum, 2 to 6 percent slopes	93	IIIw-4	12	2w3
MnA	Mahoning-Urban land complex, nearly level	94	-------	--	---
Mr	Miner silty clay loam	95	IIIw-1	11	2w1
Od	Olmsted loam	95	IIw-5	10	2w1
Or	Orrville silt loam	96	IIw-1	8	2w3
Os	Orrville silt loam, bedrock substratum	96	IIw-1	8	2w3
OtB	Oshtemo sandy loam, 2 to 6 percent slopes	97	IIIs-1	13	3s1
ReA	Ravenna silt loam, 0 to 2 percent slopes	98	IIw-3	9	2w4
ReB	Ravenna silt loam, 2 to 6 percent slopes	98	IIw-3	9	2w4
RnA	Ravenna-Urban land complex, nearly level	98	-------	--	---
RoB	Rawson loam, 2 to 6 percent slopes	99	IIe-1	7	2o1
RsB	Rittman silt loam, 2 to 6 percent slopes	100	IIe-3	8	1o1
RsB2	Rittman silt loam, 2 to 6 percent slopes, moderately eroded	100	IIe-3	8	1o1
RsC	Rittman silt loam, 6 to 12 percent slopes	101	IIIe-1	10	1o1
RsC2	Rittman silt loam, 6 to 12 percent slopes, moderately eroded	101	IIIe-1	10	1o1
RsE2	Rittman silt loam, 12 to 25 percent slopes, moderately eroded	101	IVe-3	13	1r1
RsF	Rittman silt loam, 25 to 70 percent slopes	101	VIIe-2	14	1r2
ScF	Schaffenaker loamy sand, 25 to 70 percent slopes	102	VIIe-1	14	4r1
Sg	Sebring silt loam	102	IIIw-2	12	2w2
St	Sebring silt loam, till substratum	103	IIIw-2	12	2w2
WaA	Wadsworth silt loam, 0 to 2 percent slopes	104	IIIw-4	12	2w4
WaB	Wadsworth silt loam, 2 to 6 percent slopes	105	IIIw-4	12	2w4
WbB	Wadsworth-Urban land complex, undulating	105	-------	--	---
Wc	Wallkill silt loam	106	IIw-6	10	2w1
Wt	Willette muck	106	IIIw-3	12	5w1
WuB	Wooster silt loam, 2 to 6 percent slopes	107	IIe-3	8	1o1
WuB2	Wooster silt loam, 2 to 6 percent slopes, moderately eroded	107	IIe-3	8	1o1
WuC2	Wooster silt loam, 6 to 12 percent slopes, moderately eroded	108	IIIe-1	10	1o1
WuE2	Wooster silt loam, 12 to 25 percent slopes, moderately eroded	108	IVe-2	13	1r1
WuF	Wooster silt loam, 25 to 70 percent slopes	108	VIIe-2	14	1r2

☆ U.S. GOVERNMENT PRINTING OFFICE: 1977— 203-469/31

Accessibility Statement

This document is not accessible by screen-reader software. The Natural Resources Conservation Service (NRCS) is committed to making its information accessible to all of its customers and employees. If you are experiencing accessibility issues and need assistance, please contact our Helpdesk by phone at 1-800-457-3642 or by e-mail at ServiceDesk-FTC@ftc.usda.gov. For assistance with publications that include maps, graphs, or similar forms of information, you may also wish to contact our State or local office. You can locate the correct office and phone number at http://offices.sc.egov.usda.gov/locator/app.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410, or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.



SOIL ASSOCIATIONS

SOILS THAT FORMED IN GLACIAL TILL ON UPLANDS

1 — Ellsworth-Mahoning association: Nearly level to moderately steep, moderately well drained and somewhat poorly drained soils that formed in silty clay loam glacial till

2 — Mahoning-Ellsworth association: Nearly level to sloping, somewhat poorly drained and moderately well drained soils that formed in silty clay loam glacial till

3 — Canfield-Wooster-Ravenna association: Nearly level to moderately steep, moderately well drained, well drained, and somewhat poorly drained soils that formed in loam glacial till and that have a restrictive subsoil layer (fragipan)

4 — Rittman-Wadsworth association: Nearly level to moderately steep, moderately well drained and somewhat poorly drained soils that formed in silty clay loam or clay loam glacial till and that have a restrictive subsoil layer (fragipan)

5 — Bennington-Cardington association: Nearly level to gently sloping, somewhat poorly drained and moderately well drained soils that formed in silty clay loam or clay loam glacial till

6 — Cardington-Bennington association: Mostly gently sloping to moderately steep, moderately well drained and somewhat poorly drained soils that formed in silty clay loam or clay loam glacial till

SOILS THAT FORMED IN LACUSTRINE, ALLUVIAL, OR GLACIAL OUTWASH DEPOSITS ON TERRACES AND FLOOD PLAINS AND IN GLACIAL OUTWASH AREAS

7 — Haskins-Caneadea-Lobdell association: Nearly level to gently sloping, somewhat poorly drained and moderately well drained soils that formed in loamy material overlying clayey glacial lake-deposited sediment or in clayey sediment and stream-deposited sediment; on terraces and flood plains

8 — Fitchville-Chili-Bogart association: Nearly level to sloping, somewhat poorly drained to well drained soils that formed in silty glacial lake-deposited sediment or in loamy material overlying sand and gravel; mainly on terraces

9 — Carlisle-Luray-Lorain association: Nearly level, very poorly drained organic soils and soils on glacial lakebeds; the soils formed in thick layers of partly decomposed plants or in silty and clayey glacial lake-deposited sediment

Compiled 1975

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF LANDS AND SOIL
OHIO AGRICULTURAL RESEARCH AND DEVELOPMENT CENTER

GENERAL SOIL MAP
MEDINA COUNTY, OHIO

Scale 1:190,080

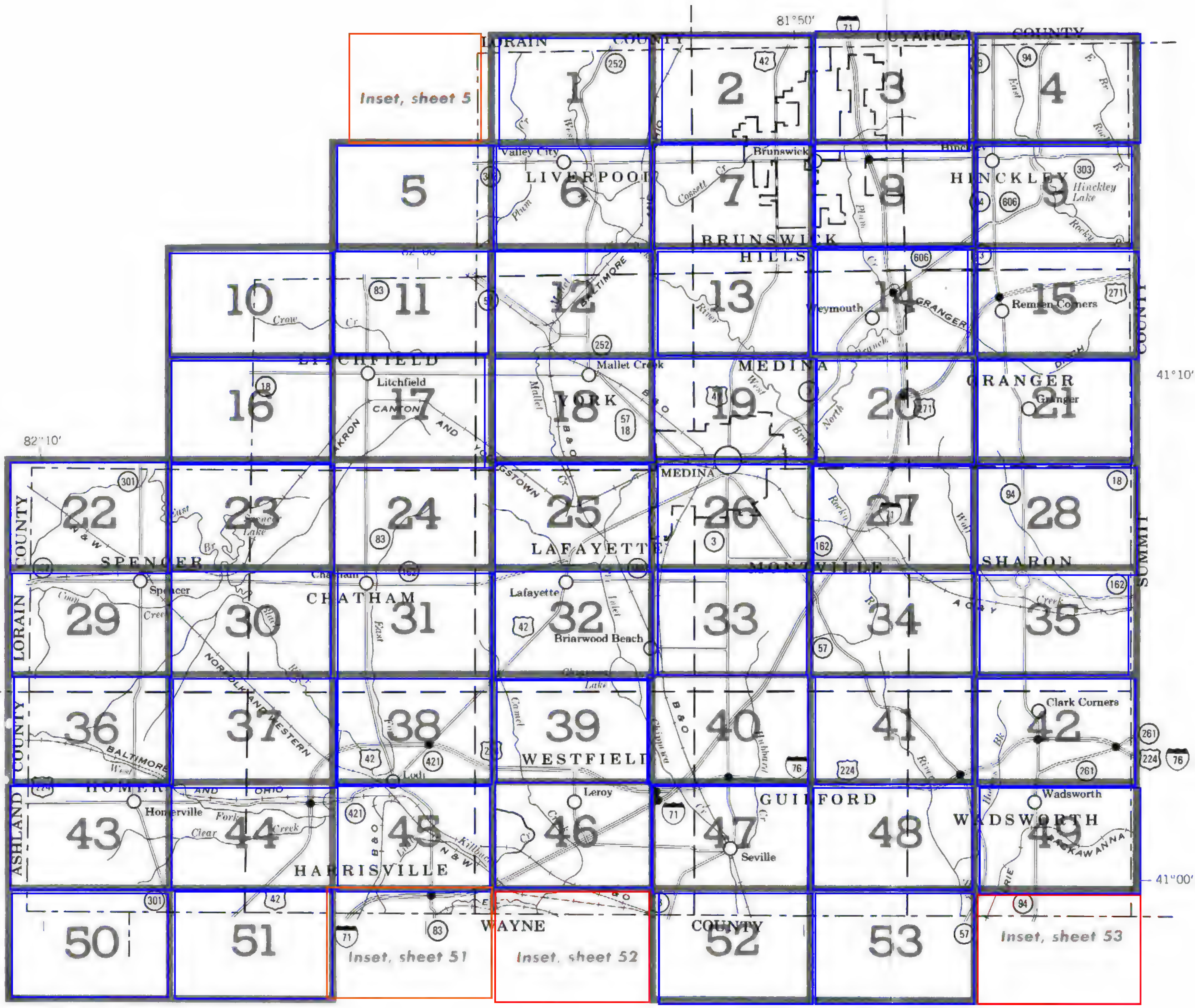
1 0 1 2 3 4 Miles

Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.

SOIL LEGEND

The first letter, always a capital, is the initial one of the soil name. A second capital letter A, B, C, E or F, shows the slope class. Symbols without a slope letter are those of nearly level soils. A final number, 2, in a symbol shows that the soil is moderately eroded.

SYMBOL	NAME
BnA	Bennington silt loam, 0 to 2 percent slopes
BnB	Bennington silt loam, 2 to 6 percent slopes
BoA	Bennington-Tiro silt loams, 0 to 2 percent slopes
BrF	Berks silt loam, 25 to 70 percent slopes
BtA	Bogart loam, 0 to 2 percent slopes
BtB	Bogart loam, 2 to 6 percent slopes
Ca	Canadice silty clay loam
CcA	Caneadea silt loam, 0 to 2 percent slopes
CcB	Caneadea silt loam, 2 to 6 percent slopes
CdA	Canfield silt loam, 0 to 2 percent slopes
CdB	Canfield silt loam, 2 to 6 percent slopes
CdB2	Canfield silt loam, 2 to 6 percent slopes, moderately eroded
CdC2	Canfield silt loam, 6 to 12 percent slopes, moderately eroded
CeC	Canfield-Urban land complex, rolling
CfB	Cardington fine sandy loam, 2 to 6 percent slopes
CgB	Cardington silt loam, 2 to 6 percent slopes
CgC2	Cardington silt loam, 6 to 12 percent slopes, moderately eroded
CgE2	Cardington silt loam, 12 to 25 percent slopes, moderately eroded
Ch	Carlisle muck
Cm	Chagrin silt loam
CnA	Chili loam, 0 to 2 percent slopes
CnB	Chili loam, 2 to 6 percent slopes
CnC	Chili loam, 6 to 12 percent slopes
CoC2	Chili gravelly loam, 6 to 12 percent slopes, moderately eroded
CoE2	Chili gravelly loam, 12 to 25 percent slopes, moderately eroded
CoF2	Chili gravelly loam, 25 to 70 percent slopes, moderately eroded
CpA	Chili silt loam, 0 to 2 percent slopes
CpB	Chili silt loam, 2 to 6 percent slopes
CpC	Chili silt loam, 6 to 12 percent slopes
CuB	Chili-Urban land complex, undulating
Cy	Condit silt loam
ElB	Ellsworth silt loam, 2 to 6 percent slopes
ElB2	Ellsworth silt loam, 2 to 6 percent slopes, moderately eroded
ElC	Ellsworth silt loam, 6 to 12 percent slopes
ElC2	Ellsworth silt loam, 6 to 12 percent slopes, moderately eroded
ElE2	Ellsworth silt loam, 12 to 25 percent slopes, moderately eroded
ElF	Ellsworth silt loam, 25 to 70 percent slopes
EsB	Ellsworth silt loam, sandstone substratum, 2 to 6 percent slopes
EsC2	Ellsworth silt loam, sandstone substratum, 6 to 12 percent slopes, moderately eroded
EuB	Ellsworth-Urban land complex, undulating
FcA	Fitchville silt loam, 0 to 2 percent slopes
FcB	Fitchville silt loam, 2 to 6 percent slopes
FlA	Fitchville silt loam, low terrace, 0 to 2 percent slopes
GbC	Geeburg silt loam, 6 to 18 percent slopes
GfA	Glenford silt loam, 0 to 2 percent slopes
GfB	Glenford silt loam, 2 to 6 percent slopes
GfC2	Glenford silt loam, 6 to 12 percent slopes, moderately eroded
HsA	Haskins loam, 0 to 2 percent slopes
HsB	Haskins loam, 2 to 6 percent slopes
Hy	Holly silt loam
JtA	Jimtown loam, 0 to 2 percent slopes
JtB	Jimtown loam, 2 to 6 percent slopes
Ju	Jimtown-Urban land complex
Ld	Linwood muck
Le	Lobdell silt loam
Ln	Lorain silty clay loam
LoB	Loudonville silt loam, 2 to 6 percent slopes
LoC	Loudonville silt loam, 6 to 12 percent slopes
LoC2	Loudonville silt loam, 6 to 12 percent slopes, moderately eroded
LoE2	Loudonville silt loam, 12 to 25 percent slopes, moderately eroded
Ly	Luray silt loam
MgA	Mahoning silt loam, 0 to 2 percent slopes
MgB	Mahoning silt loam, 2 to 6 percent slopes
MlA	Mahoning silt loam, sandstone substratum, 0 to 2 percent slopes
MlB	Mahoning silt loam, sandstone substratum, 2 to 6 percent slopes
MnA	Mahoning-Urban land complex, nearly level
Mi	Miner silty clay loam
Od	Olmsted loam
Or	Orrville silt loam
Os	Orrville silt loam, bedrock substratum
OtB	Oshtemo sandy loam, 2 to 6 percent slopes
ReA	Ravenna silt loam, 0 to 2 percent slopes
ReB	Ravenna silt loam, 2 to 6 percent slopes
RnA	Ravenna-Urban land complex, nearly level
RoB	Rawson loam, 2 to 6 percent slopes
RsB	Rittman silt loam, 2 to 6 percent slopes
RsB2	Rittman silt loam, 2 to 6 percent slopes, moderately eroded
RsC	Rittman silt loam, 6 to 12 percent slopes
RsC2	Rittman silt loam, 6 to 12 percent slopes, moderately eroded
RsE2	Rittman silt loam, 12 to 25 percent slopes, moderately eroded
RsF	Rittman silt loam, 25 to 70 percent slopes
ScF	Schaffenaker loamy sand, 25 to 70 percent slopes
Sg	Sebring silt loam
St	Sebring silt loam, till substratum
WaA	Wadsworth silt loam, 0 to 2 percent slopes
WaB	Wadsworth silt loam, 2 to 6 percent slopes
WbB	Wadsworth-Urban land complex, undulating
Wc	Wallkill silt loam
Wt	Willette muck
WuB	Wooster silt loam, 2 to 6 percent slopes
WuB2	Wooster silt loam, 2 to 6 percent slopes, moderately eroded
WuC2	Wooster silt loam, 6 to 12 percent slopes, moderately eroded
WuE2	Wooster silt loam, 12 to 25 percent slopes, moderately eroded
WuF	Wooster silt loam, 25 to 70 percent slopes

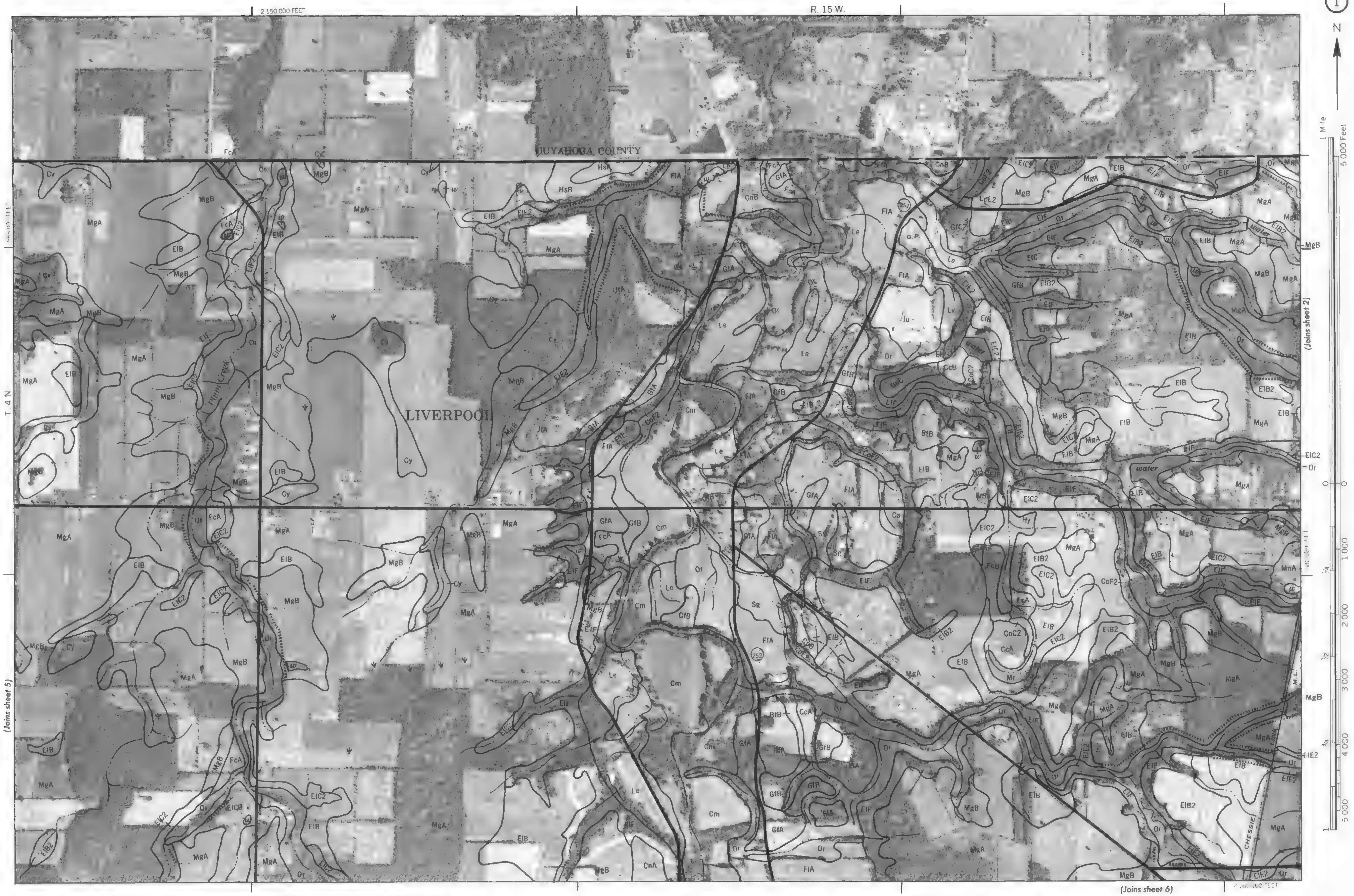


INDEX TO MAP SHEETS

MEDINA COUNTY, OHIO

Scale 1:190,080

1 0 1 2 3 4 Miles

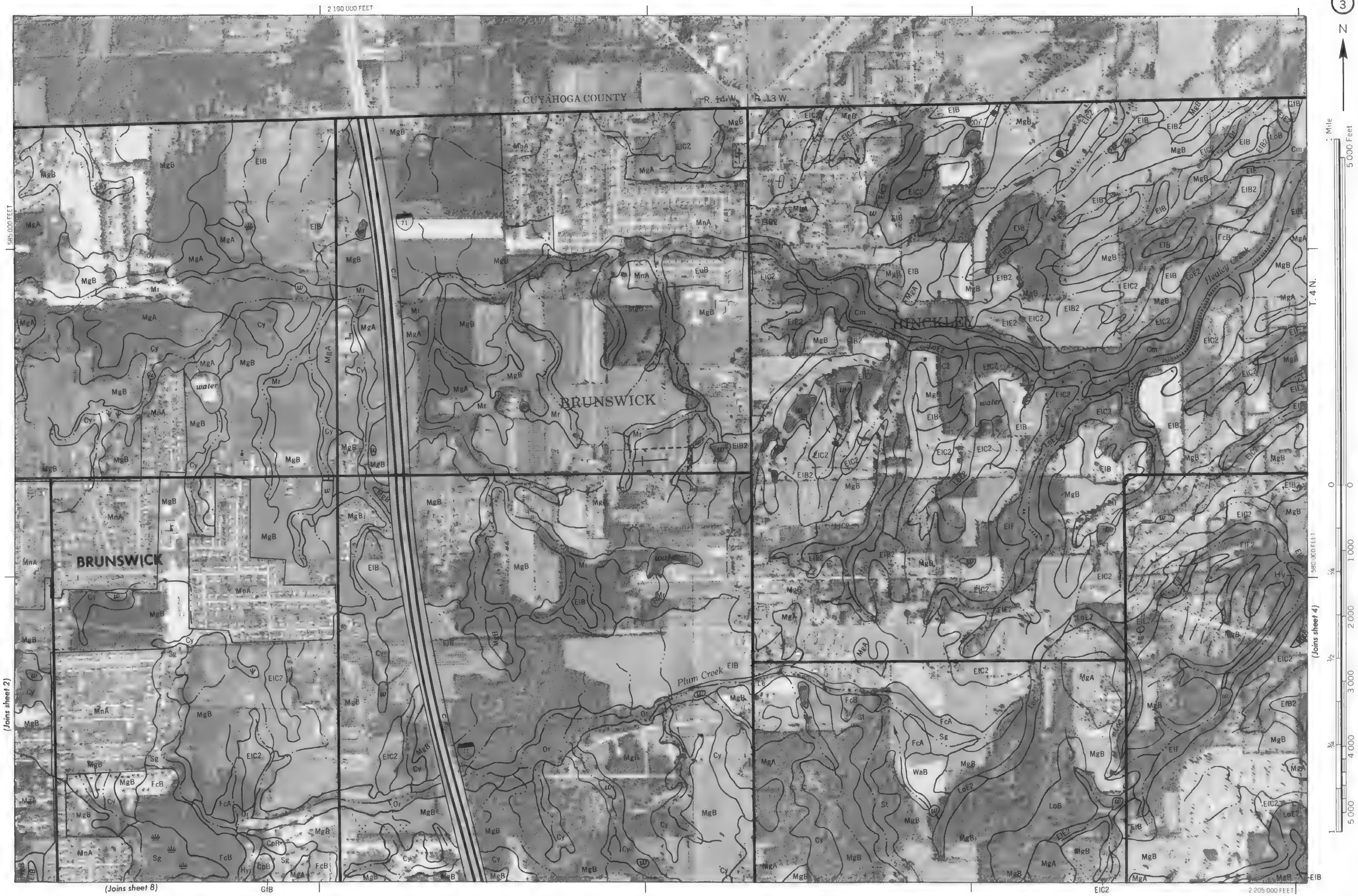


MEDINA COUNTY, OHIO NO. 1

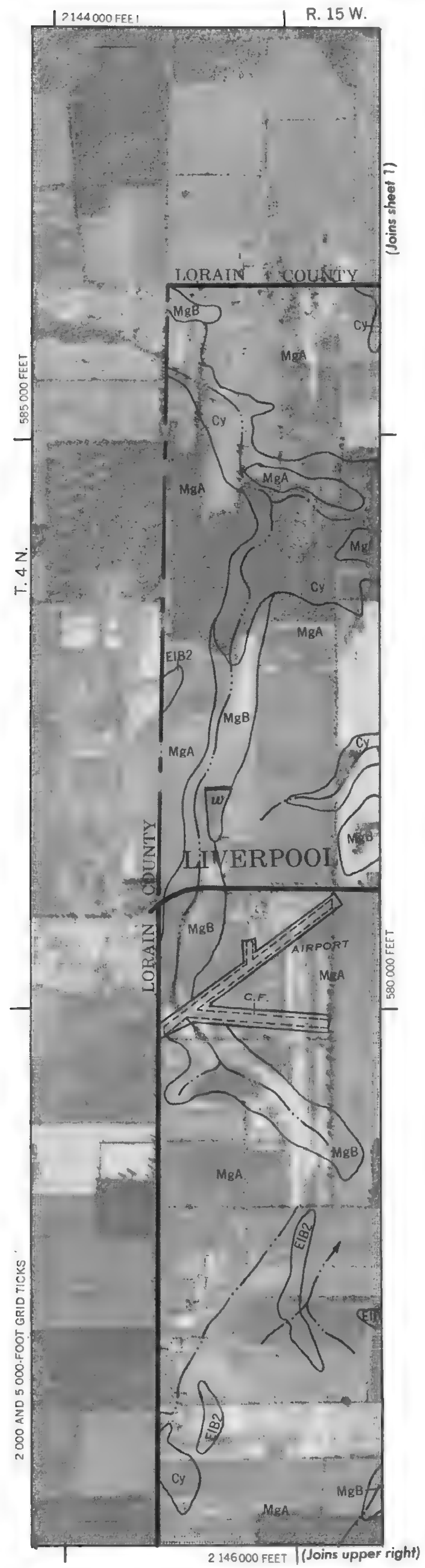

2
N
1 Mile
5 000 Feet
LORAIN COUNTY
CUYAHOGA COUNTY
R. 15 W.
R. 14 W.
T. 4 N.
2 185 000 FEET
585 000 FEET
2 170 000 FEET
LIVERPOOL
BRUNSWICK
CHESSIE LINE
MADE LAND
water
(Joins sheet 1)
(Joins sheet 3)
(Joins sheet 7)
MEDINA COUNTY, OHIO NO. 2

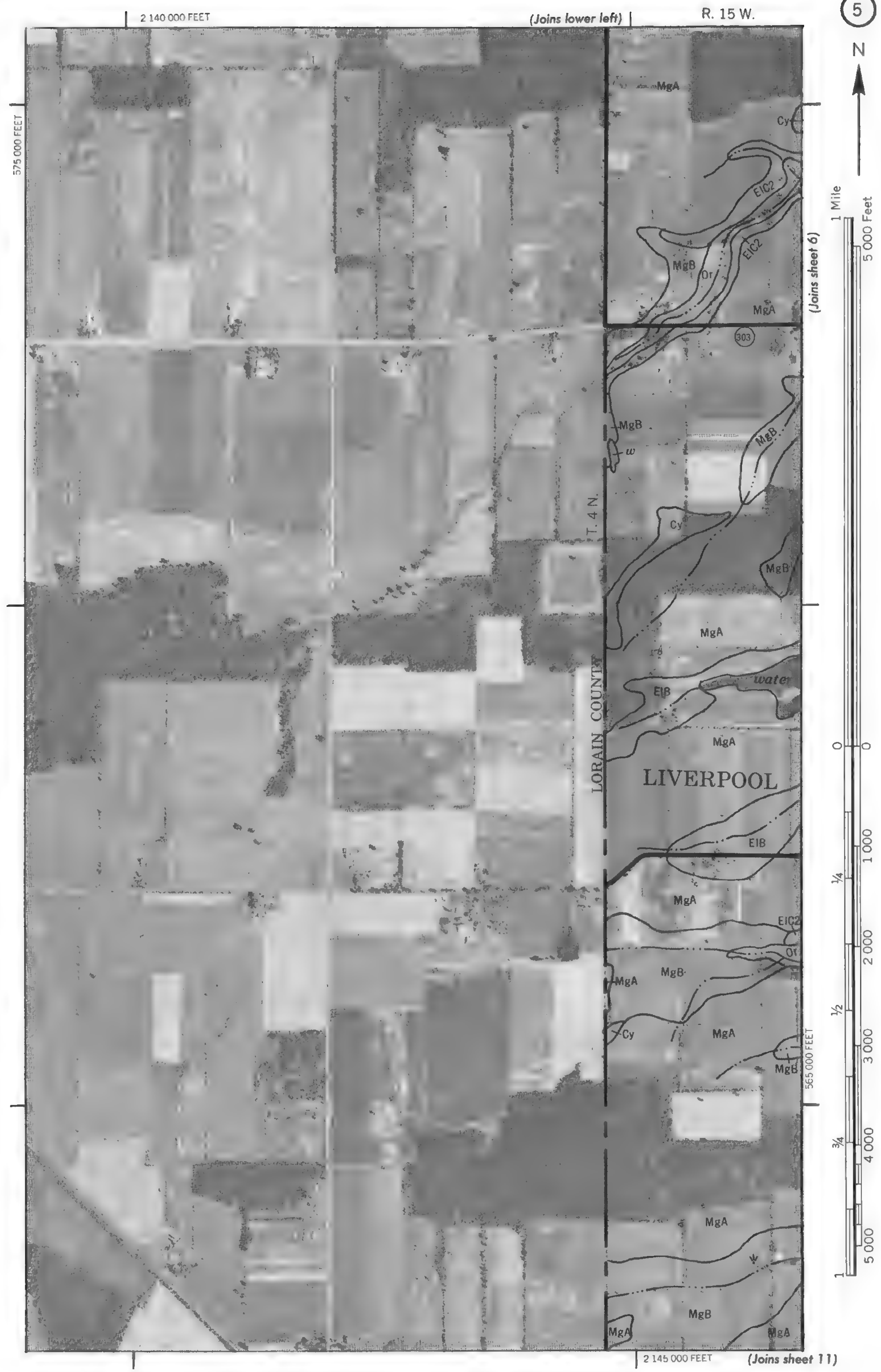
MEDINA COUNTY, OHIO NO. 3

This map is compiled on 197_ aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



MEDINA COUNTY, OHIO NO. 4





MEDINA COUNTY, OHIO NO. 5

This map is compiled on 1973 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

(Joins sheet 1)

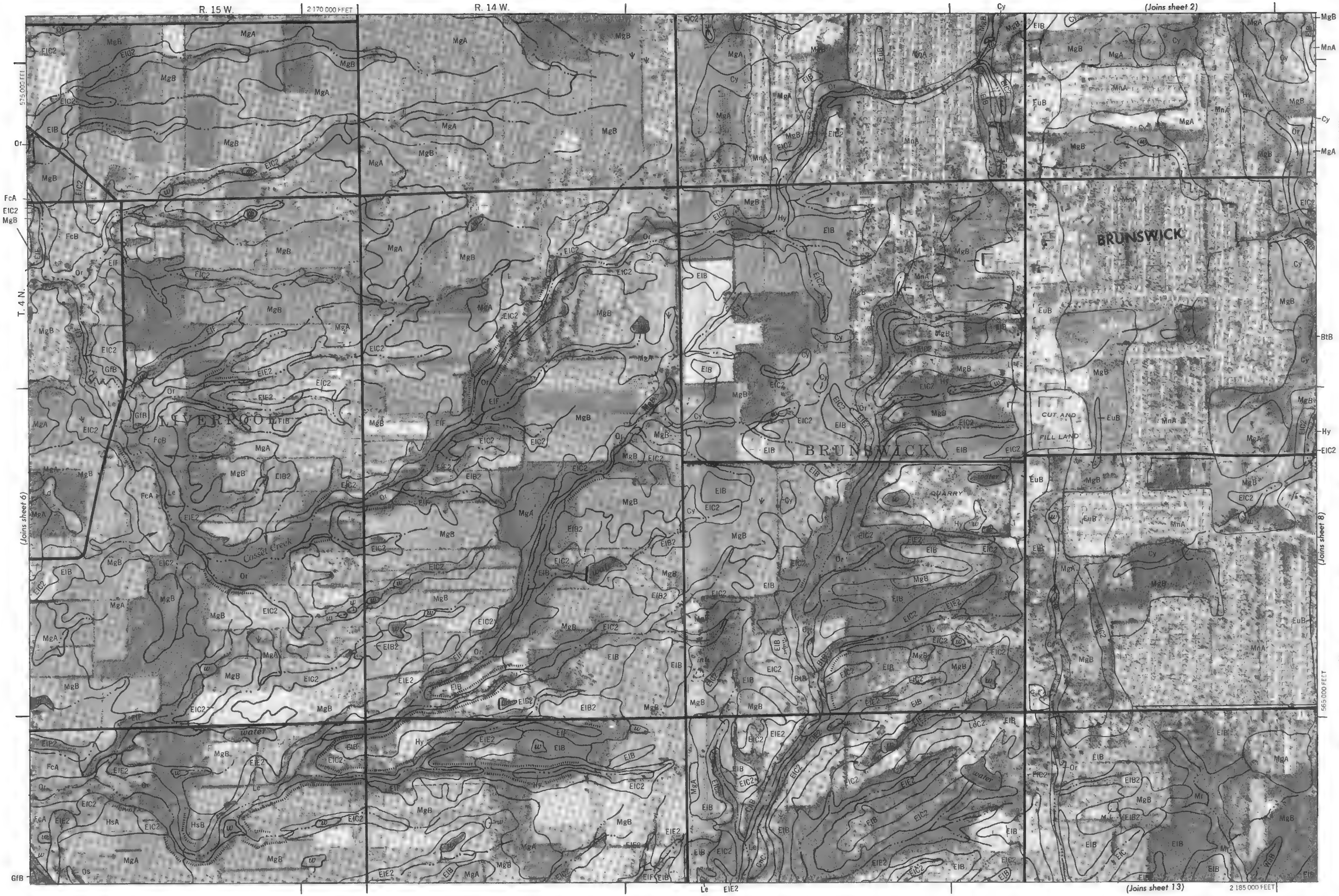
R. 15 W.

N

1 Mile
5 000 Feet
0
¼
½
¾
1
0
1000
2000
3000
4000
5000

(Joins sheet 12)

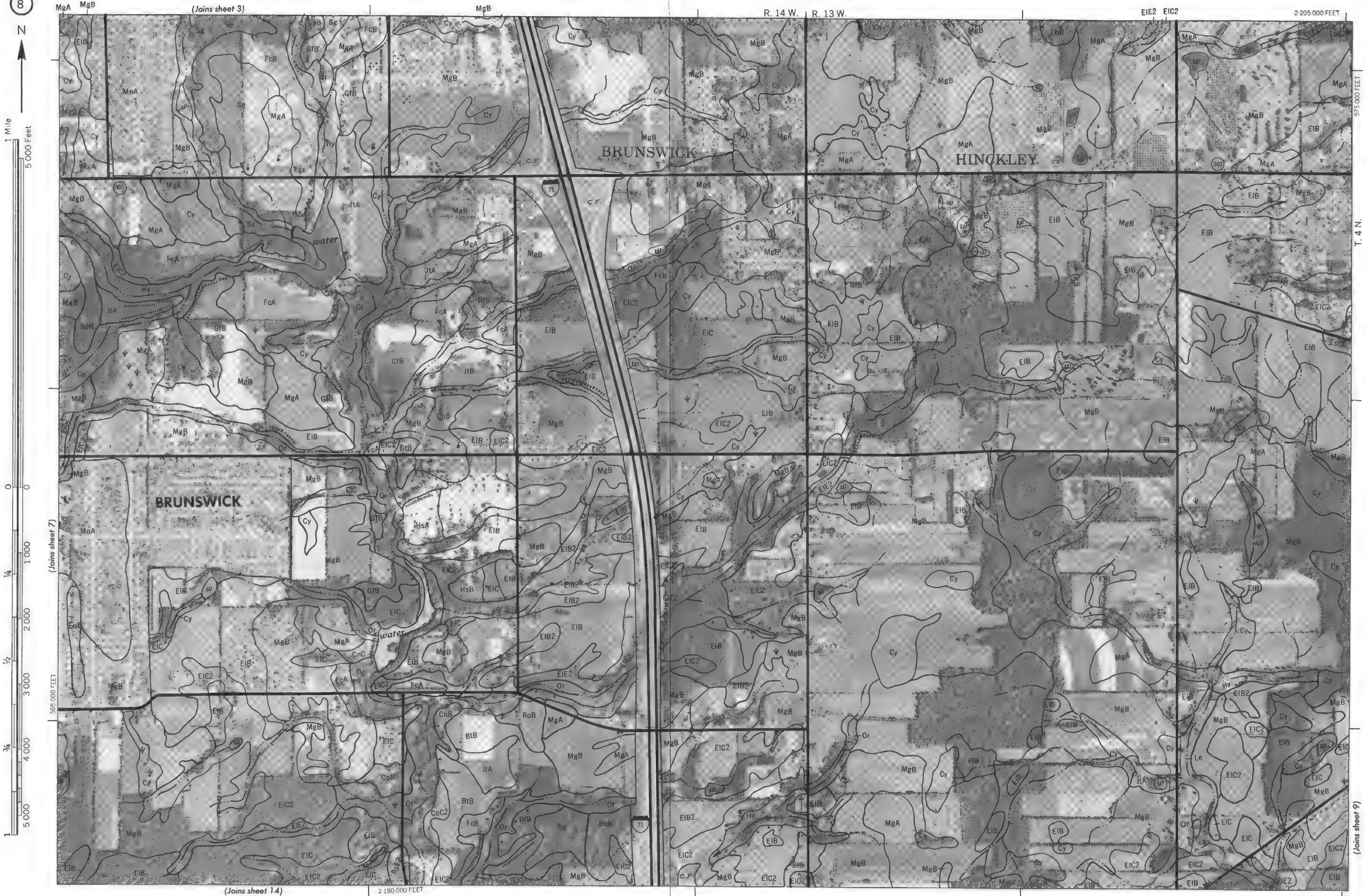
This map is compiled on 1973 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



MEDINA COUNTY, OHIO NO. 7

This map is compiled on 1973 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

MEDINA COUNTY, OHIO — SHEET NUMBER 8



MEDINA COUNTY, OHIO NO. 9

This map is compiled on 1973 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

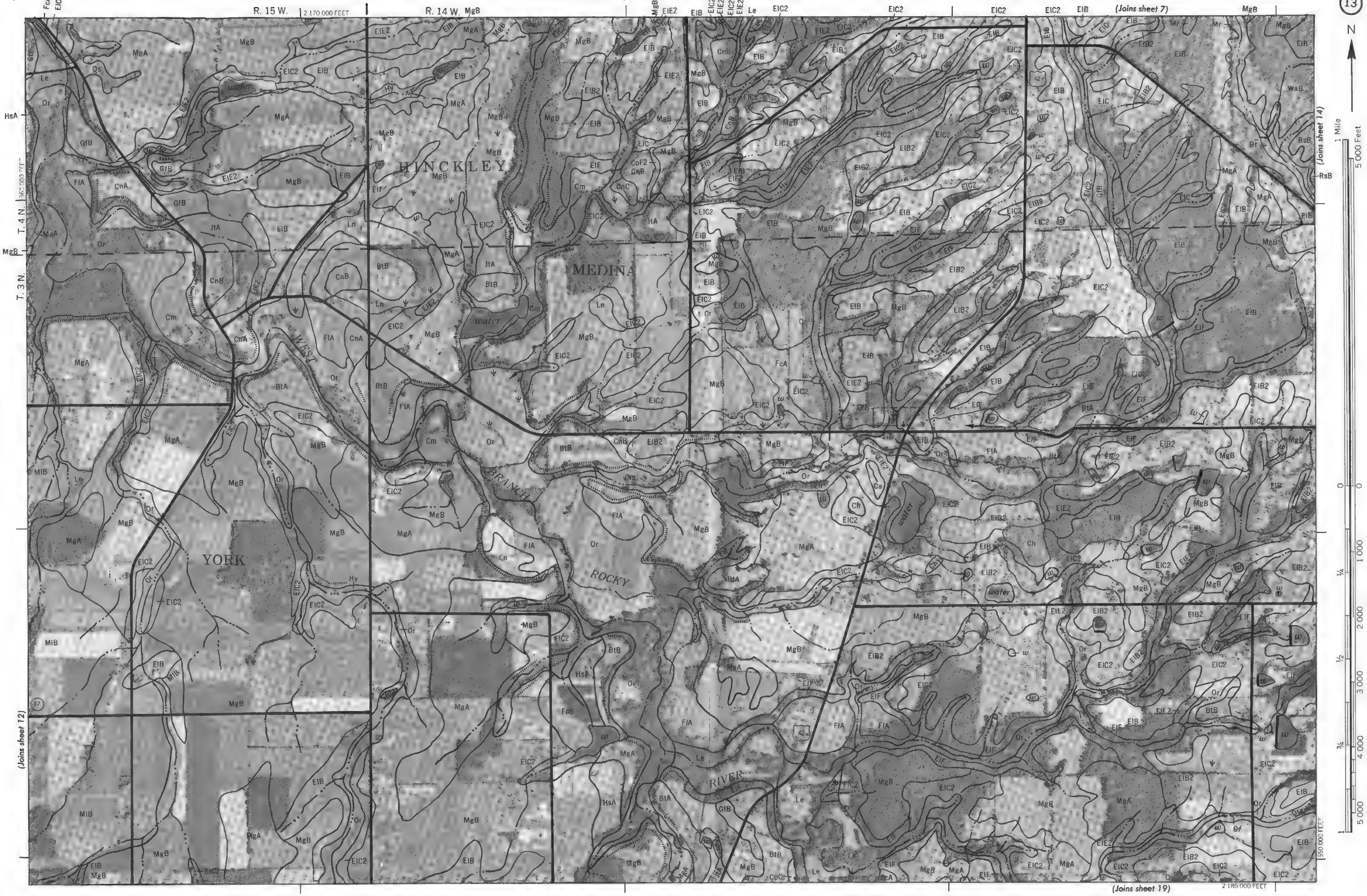
This map is compiled on 1973 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

MEDINA COUNTY, OHIO NO. 11

This map is compiled on 1972 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

This map is compiled on 1973 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

MEDINA COUNTY, OHIO NO. 12



MEDINA COUNTY, OHIO NO. 13

This map is compiled on 1973 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

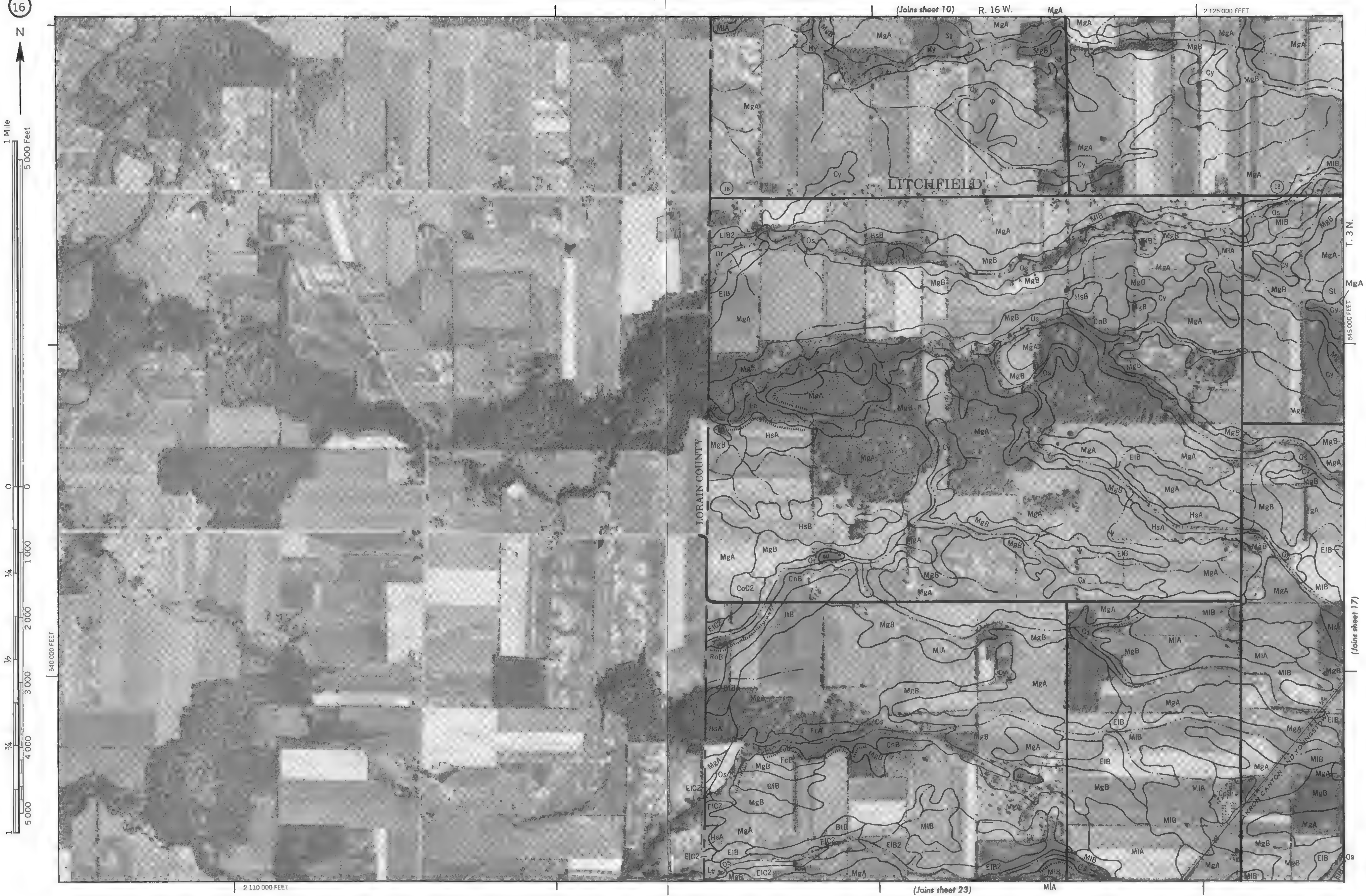
MEDINA COUNTY, OHIO — SHEET NUMBER 14

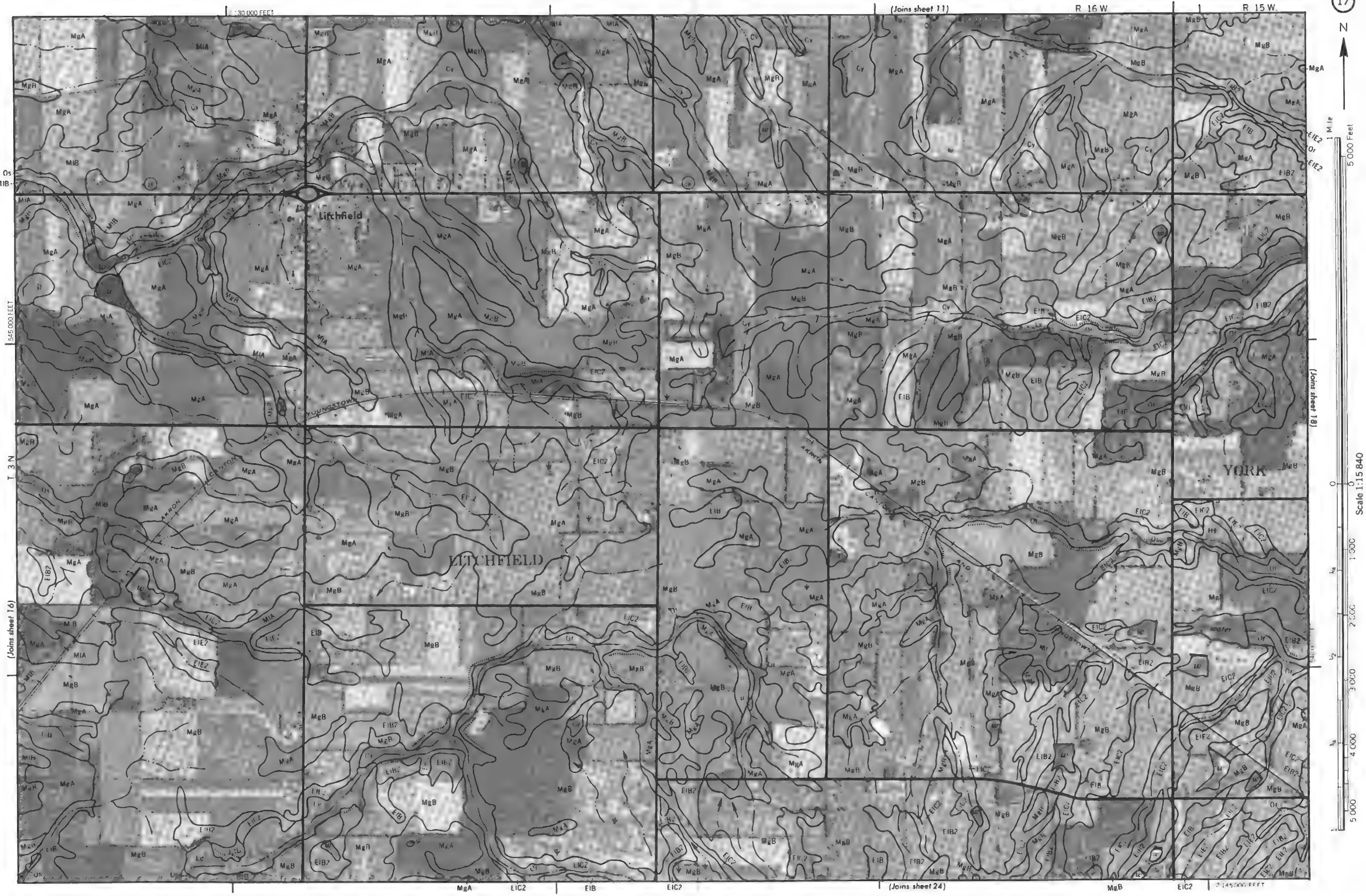
This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

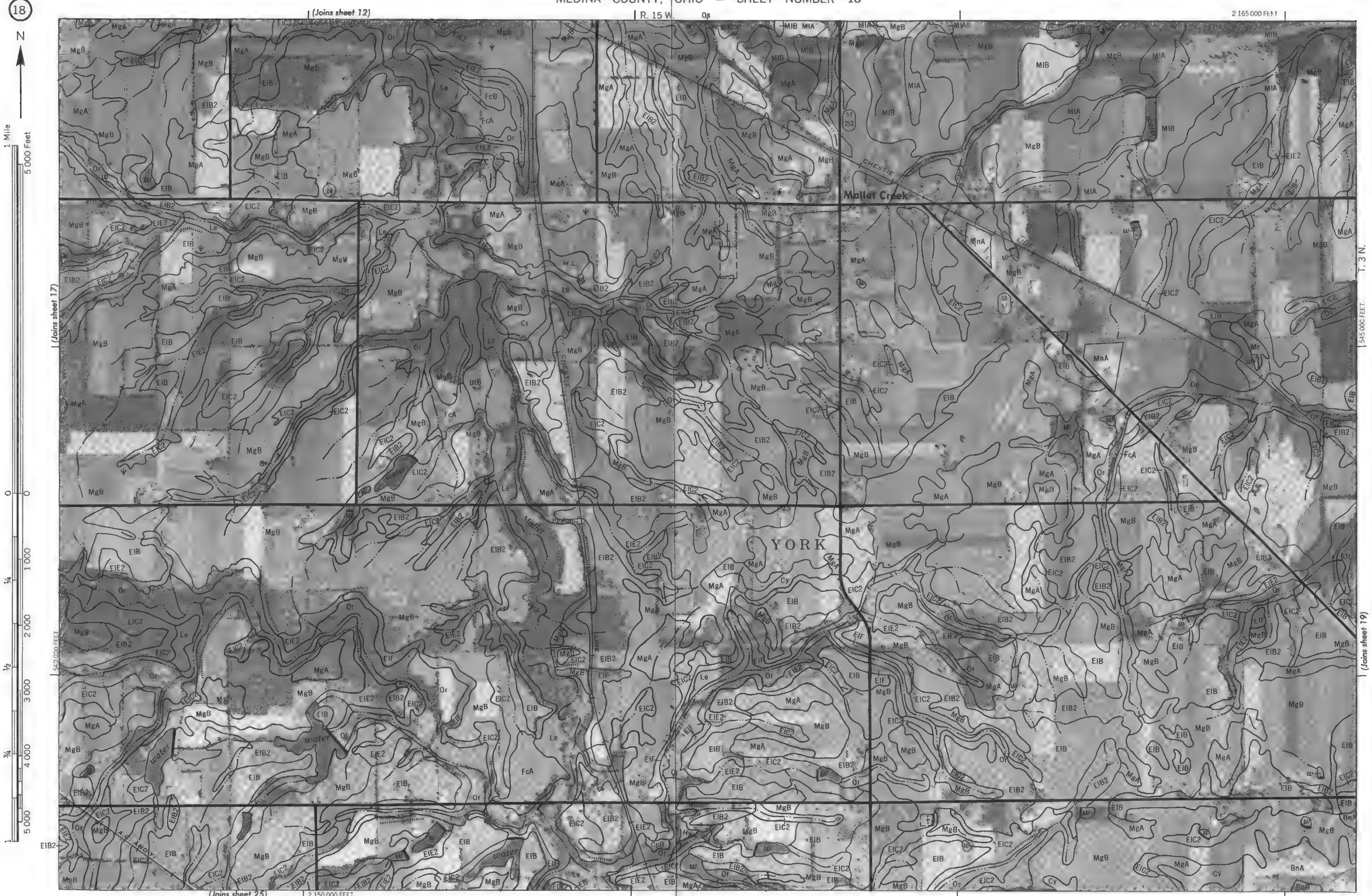
MEDINA COUNTY, OHIO NO. 14

MEDINA COUNTY, OHIO NO. 15

This map is compiled on 1973 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.


N
1 Mile
5 000 Feet
0
1 000
¼
2 000
½
3 000
¾
4 000
5 000
1
(Joins sheet 10)
R. 16 W.
2 125 000 FEET
LITCHFIELD
LORAIN COUNTY
T. 3 N.
545 000 FEET
540 000 FEET
(Joins sheet 17)
(Joins sheet 23)
2 110 000 FEET
AKRON CANTON AND YOUNGSTOWN


17
N
(Joins sheet 11)
R. 16 W.
R. 15 W.
Litchfield
LITCHFIELD
YORK
YOUNGSTOWN
AKRON
CANTON
T. 3 N.
(Joins sheet 16)
(Joins sheet 18)
(Joins sheet 24)
545 000 FEET
1 Mile
5 000 Feet
Scale 1:15 840
MEDINA COUNTY, OHIO NO. 17



This map is compiled on 1973 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

MEDINA COUNTY, OHIO NO. 19

This map is compiled on 1973 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

This map is compiled on 1971 aerial photographs by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

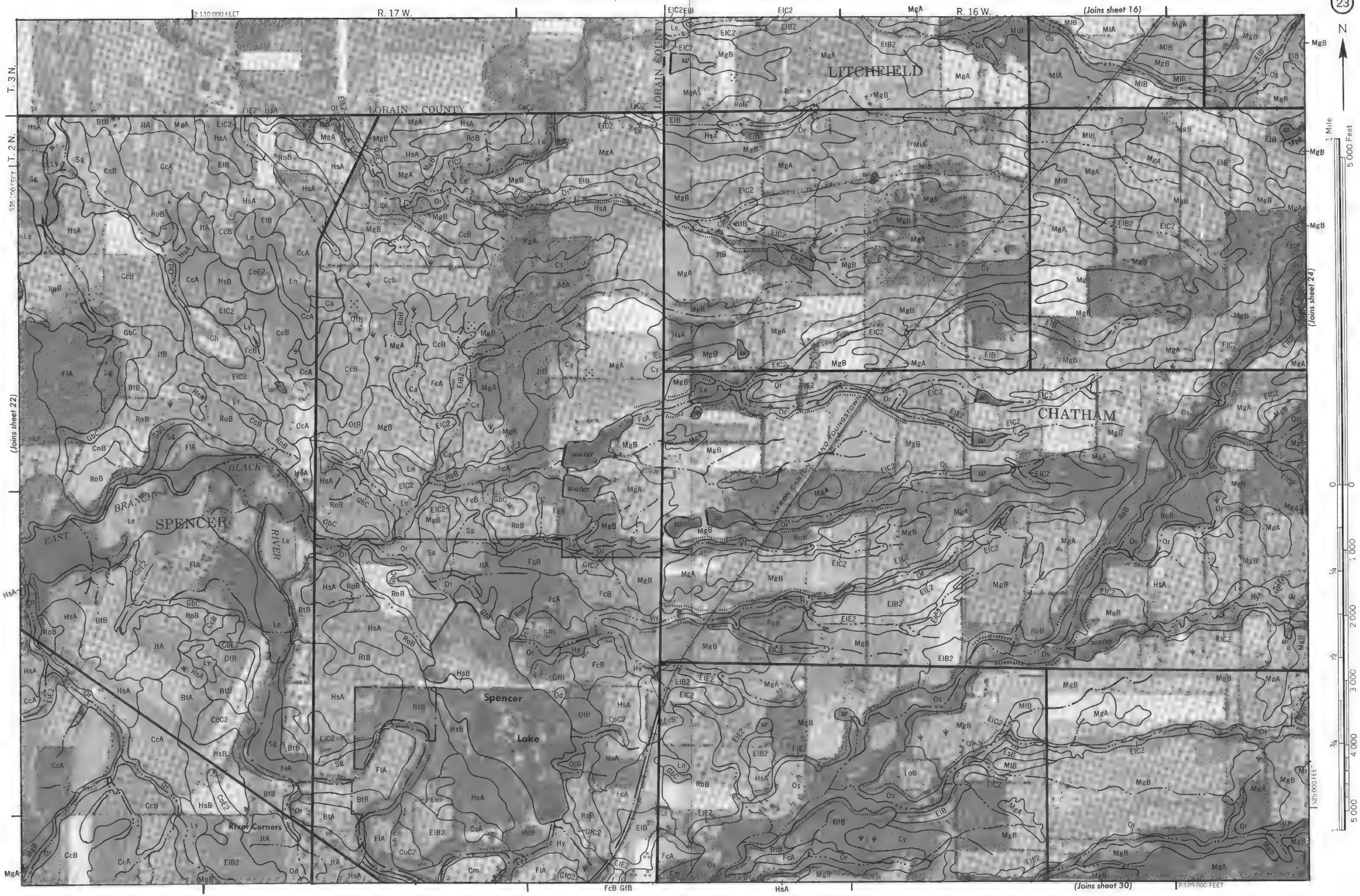
MEDINA COUNTY, OHIO NO. 20

MEDINA COUNTY, OHIO NO. 21

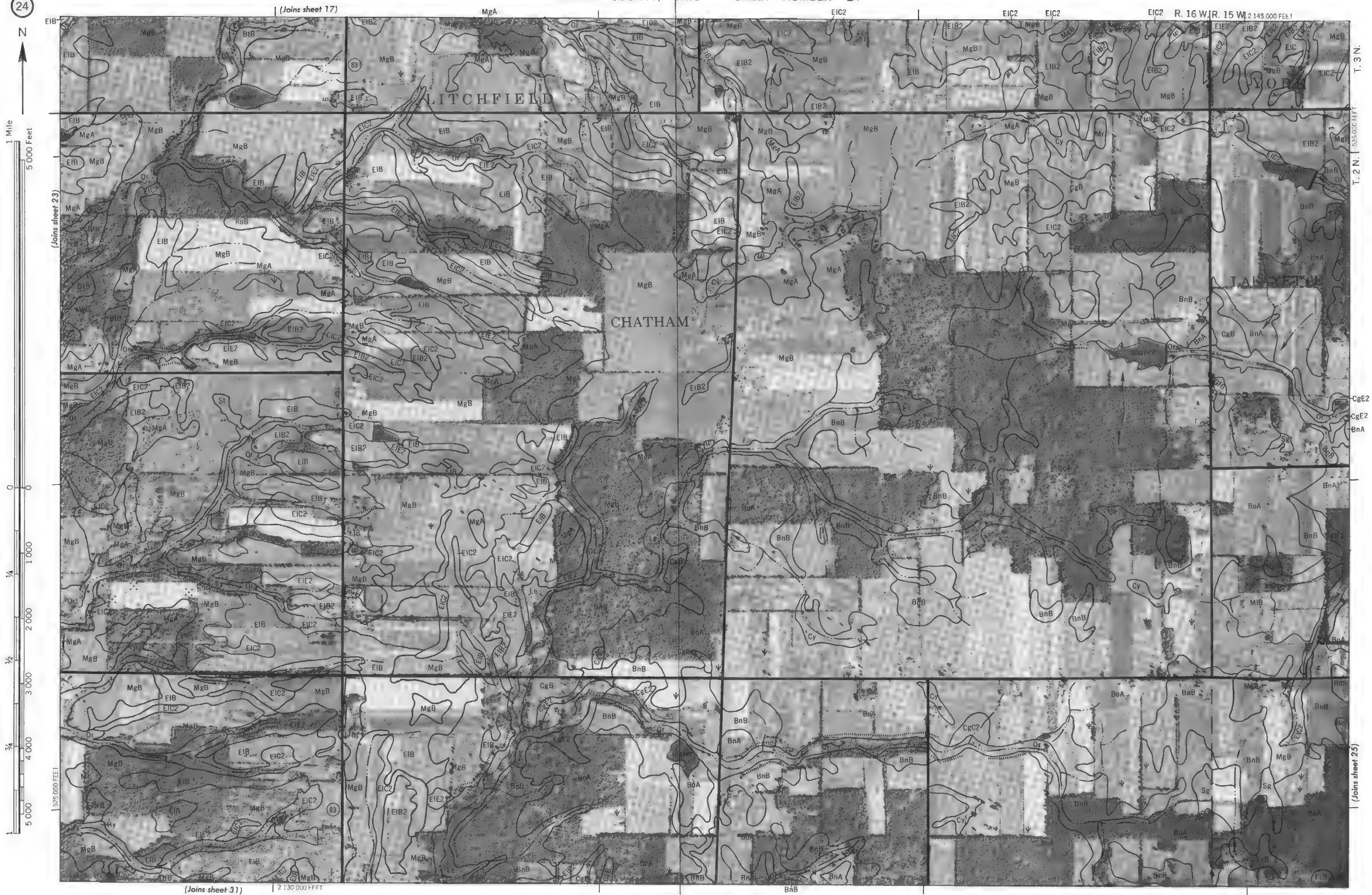
This map is compiled on 1973 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

This map is compiled on [illegible] aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

MEDINA COUNTY, OHIO NO. 22

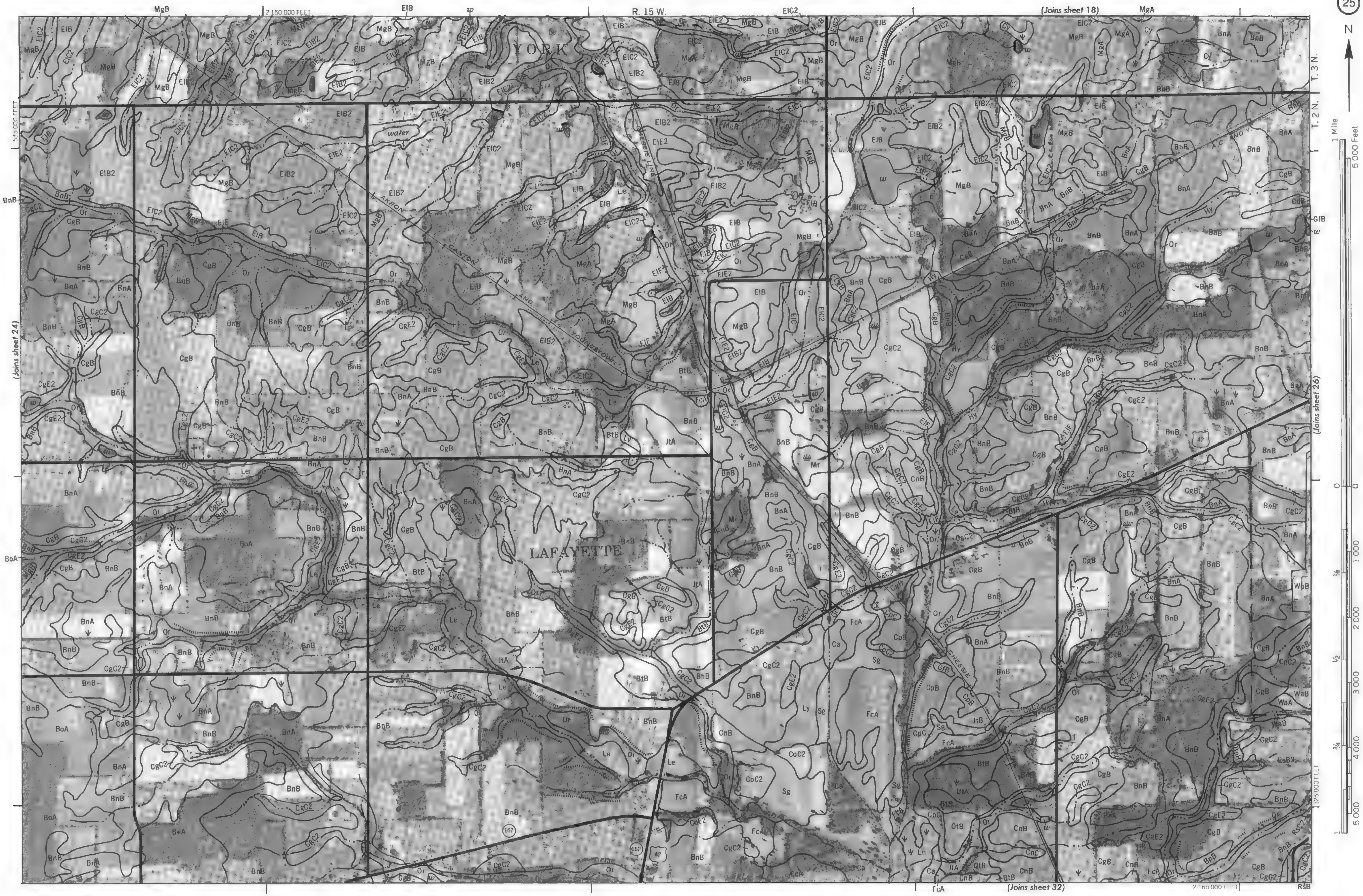


MEDINA COUNTY, OHIO NO. 23



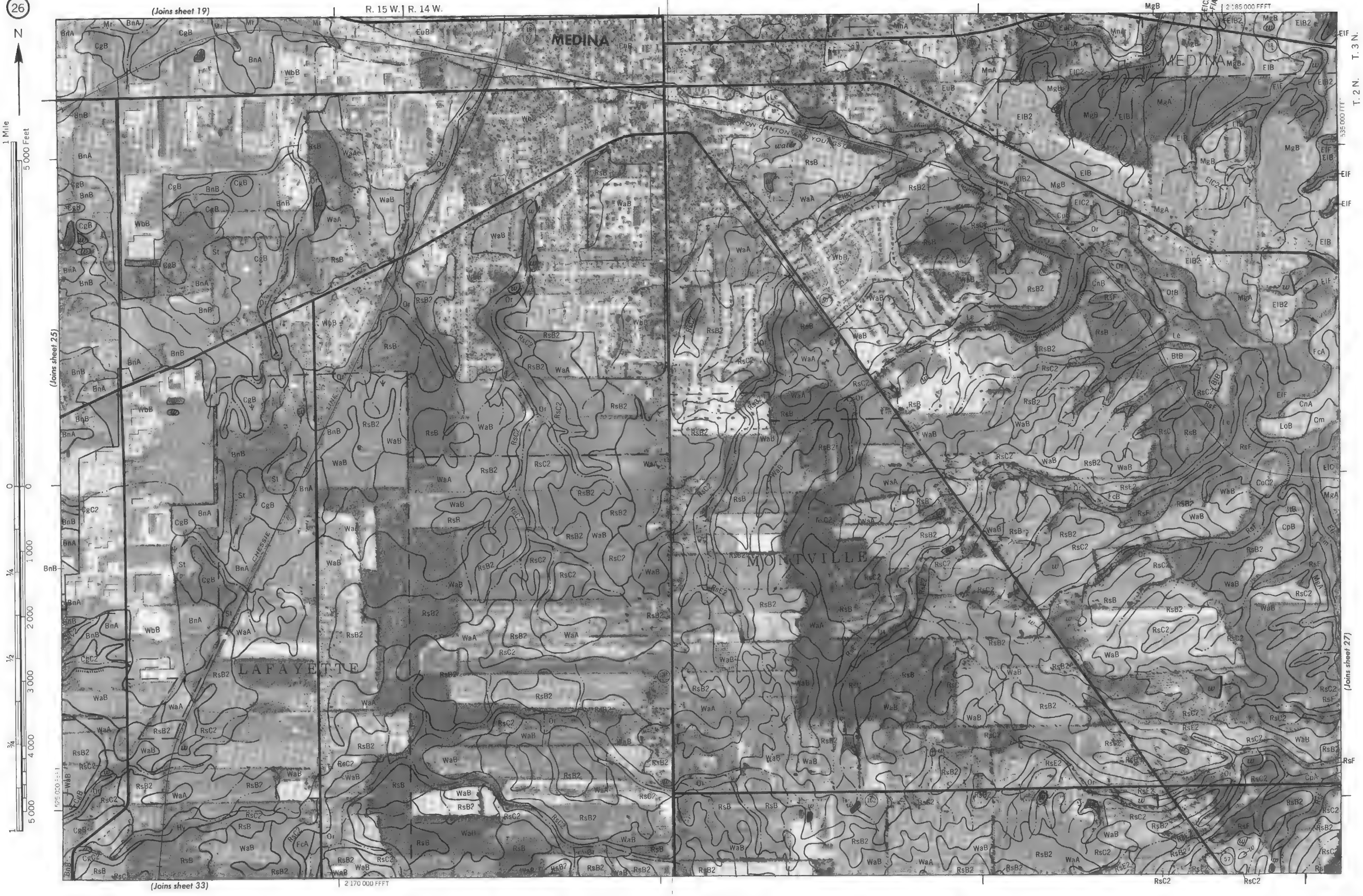
This map is compiled on [illegible] aerial photographs by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

MEDINA COUNTY, OHIO NO. 24



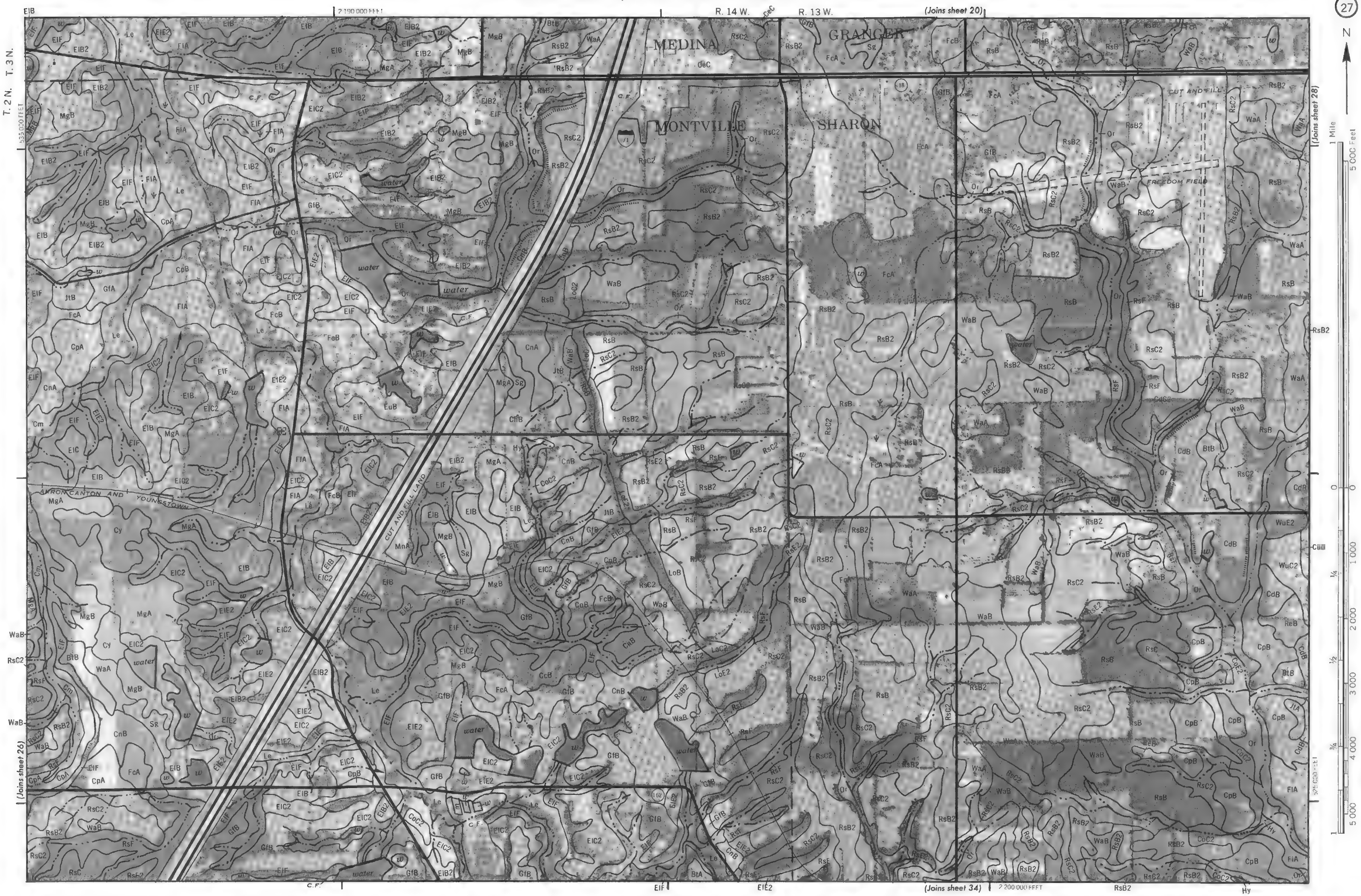
MEDINA COUNTY, OHIO NO. 25

This map is compiled on 1973 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



MEDINA COUNTY, OHIO NO. 26

MEDINA COUNTY, OHIO — SHEET NUMBER 27



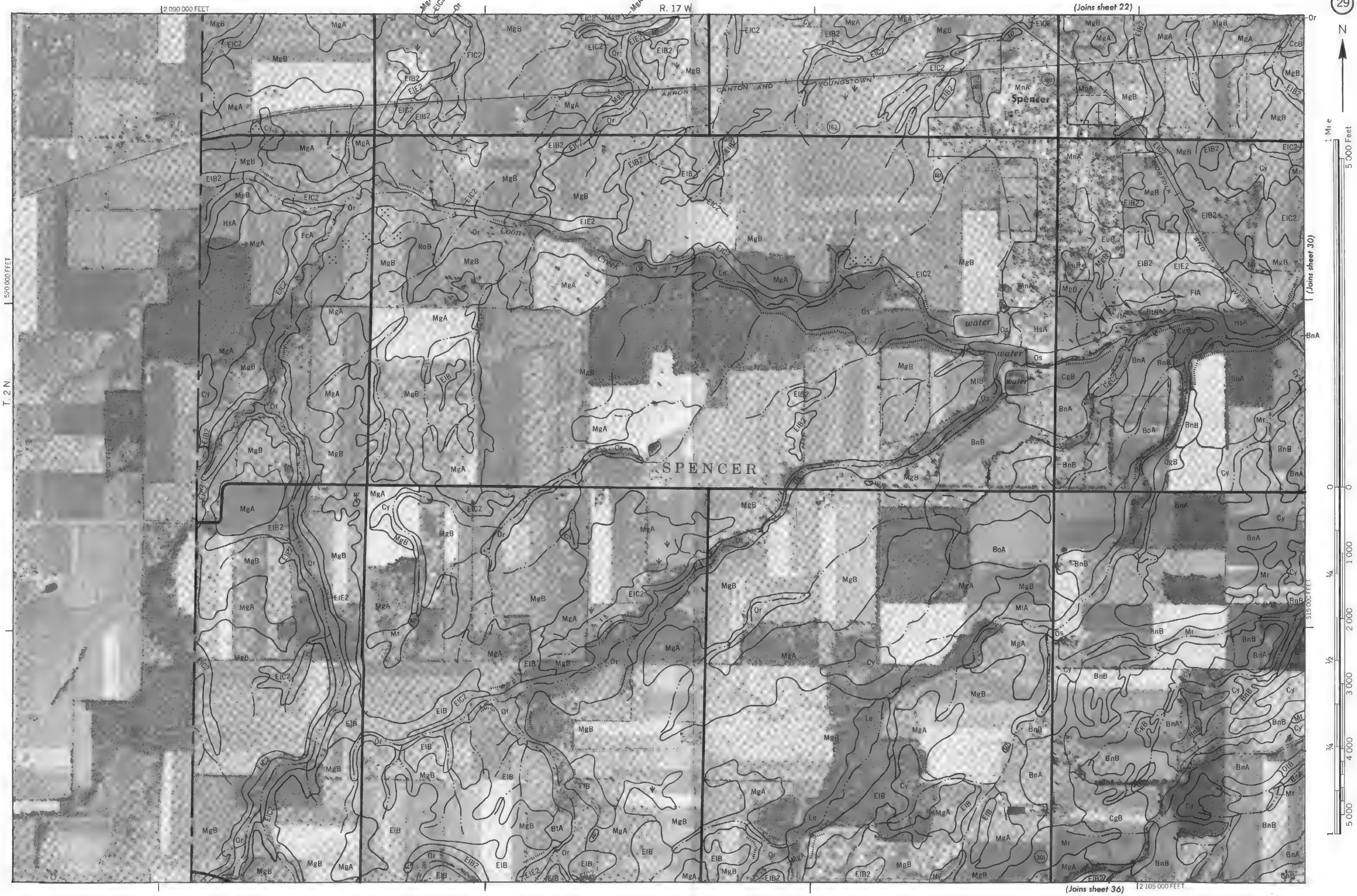
MEDINA COUNTY, OHIO NO. 27

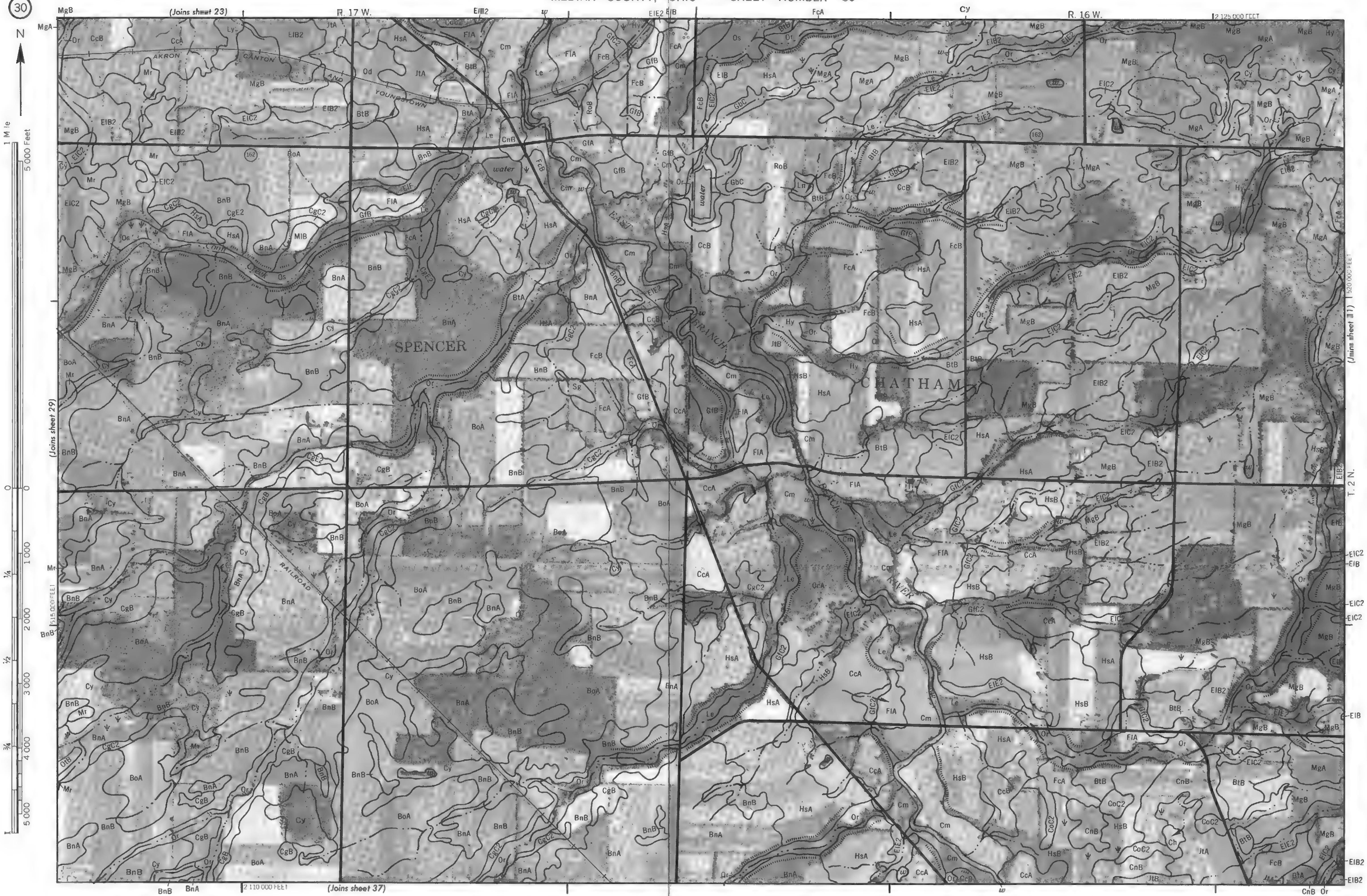
This map is compiled on 1965 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.


28
(Joins sheet 21)
(Joins sheet 27)
(Joins sheet 35)
R. 13 W.
T. 3 N.
T. 2 N.
N
GRANGER
SHARON
SUMMIT COUNTY
water
GRAVEL PIT
2 220 000 FEET
2 205 000 FEET
535 000 FEET
525 000 FEET
1 Mile
5 000 Feet
0
1 000
2 000
3 000
4 000
5 000
¼
½
¾

MEDINA COUNTY, OHIO NO. 29

This map is compiled on 19[illegible] aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



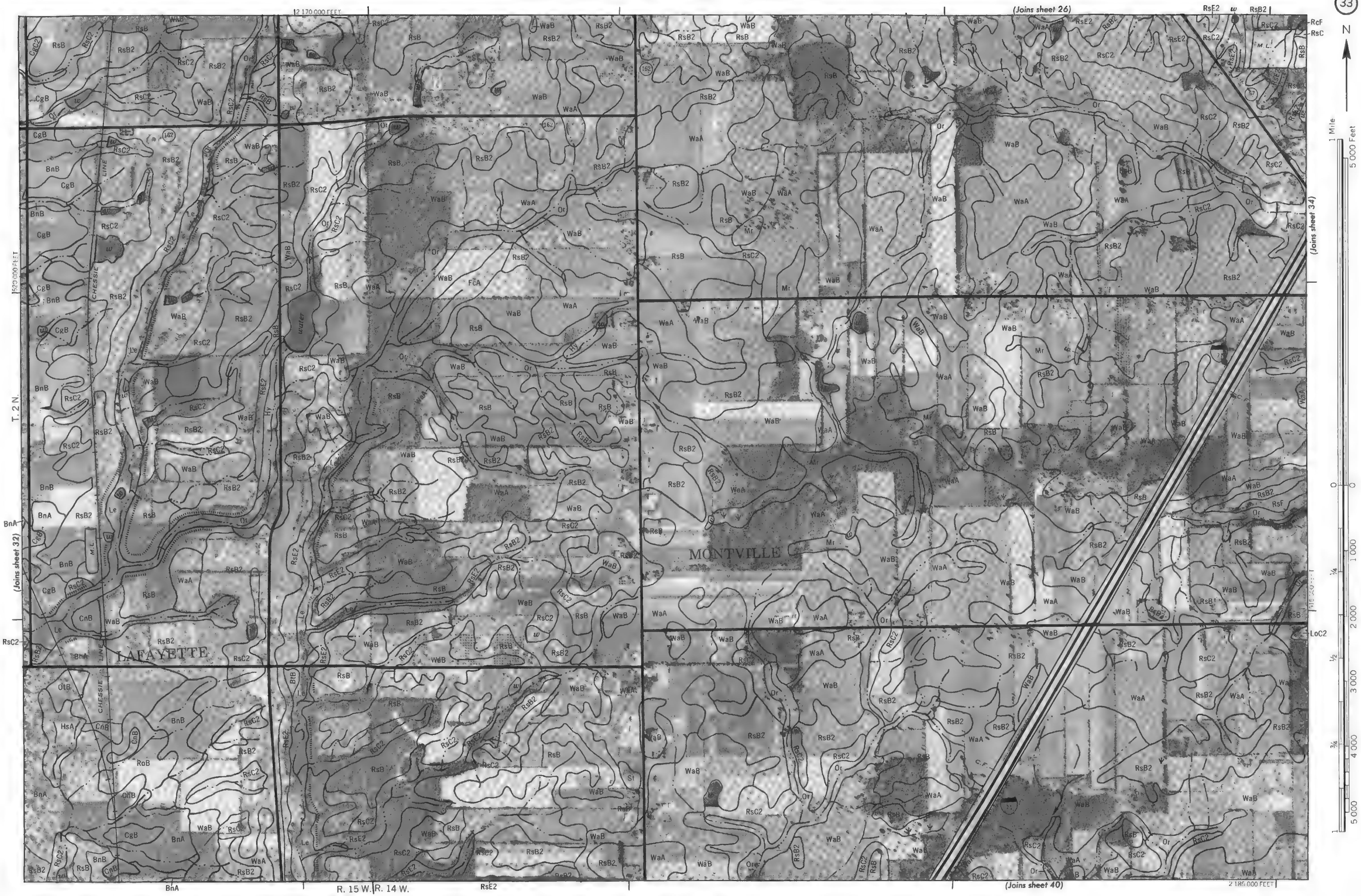


MEDINA COUNTY, OHIO NO. 30

MEDINA COUNTY, OHIO NO. 31

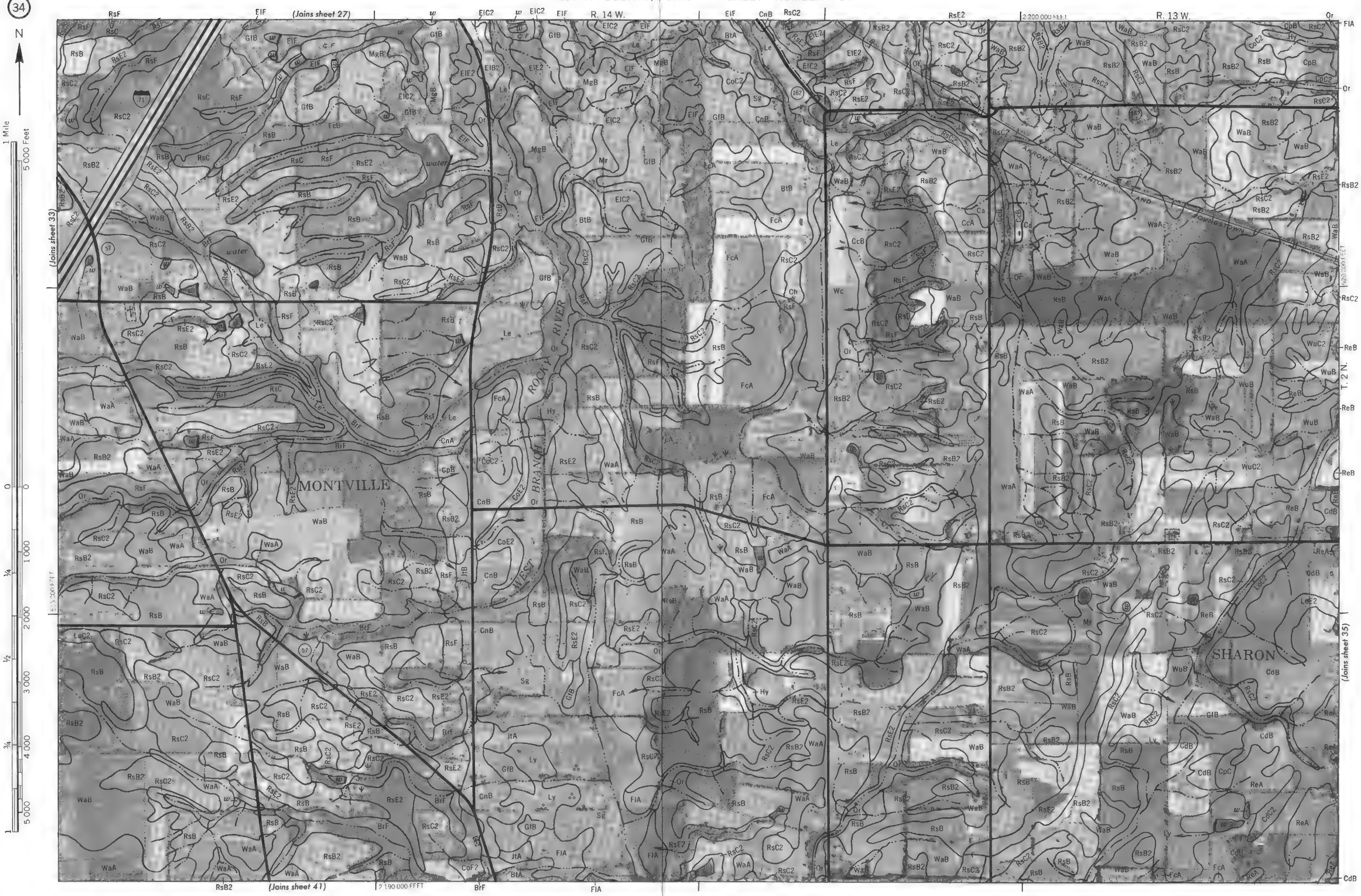
This map is compiled on 1973 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.


N
(Joins sheet 25)
(Joins sheet 31)
(Joins sheet 33)
(Joins sheet 39)
R. 15 W.
T. 2 N.
2 165 000 FEET
2 150 000 FEET
Lafayette
LAFAYETTE
Briarwood Bench
Chippewa Lake
Chippewa On The Lake
RAILROAD
water
1 Mile
5 000 Feet



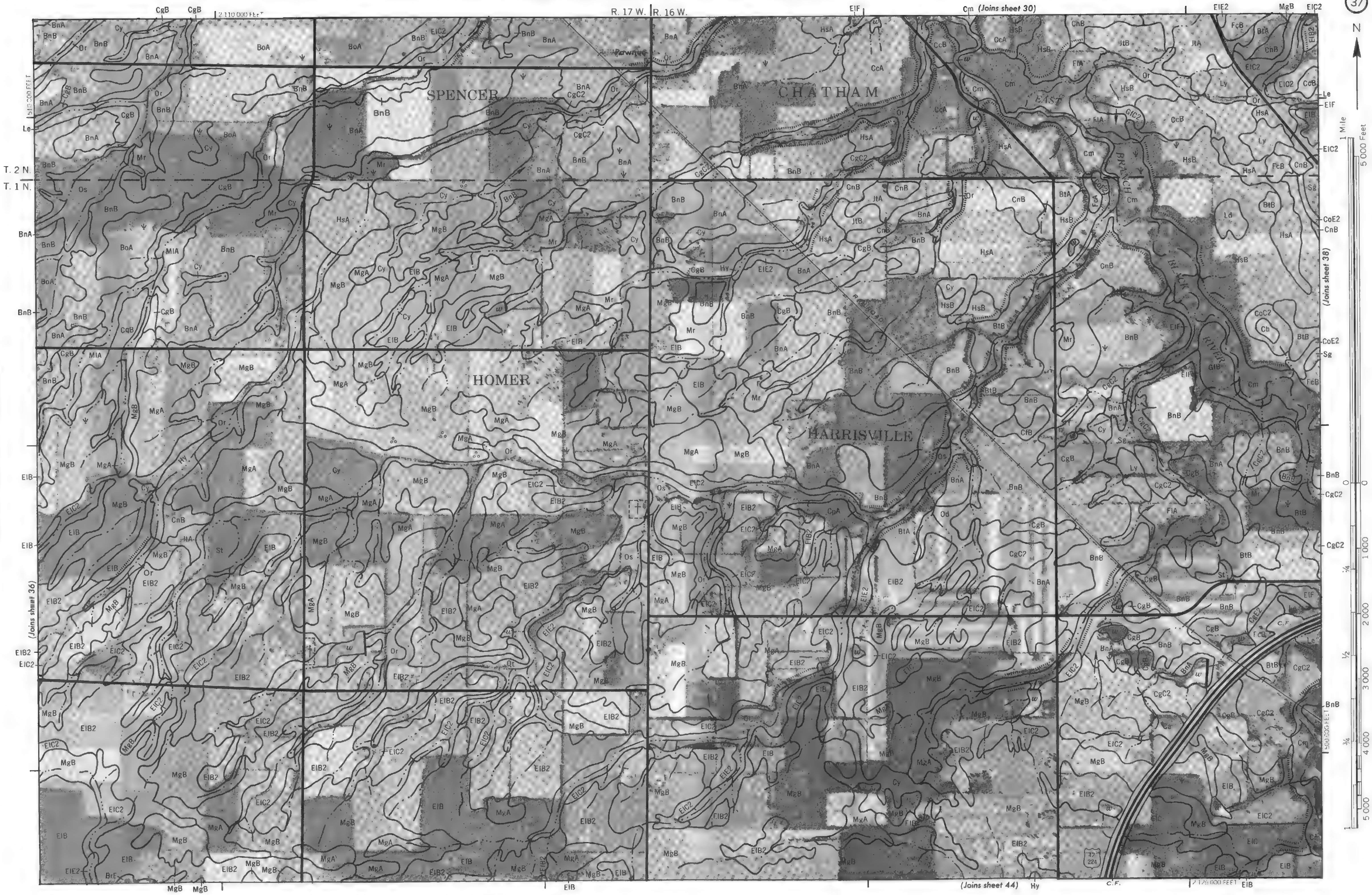
MEDINA COUNTY, OHIO NO. 33

This map is compiled on 1973 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

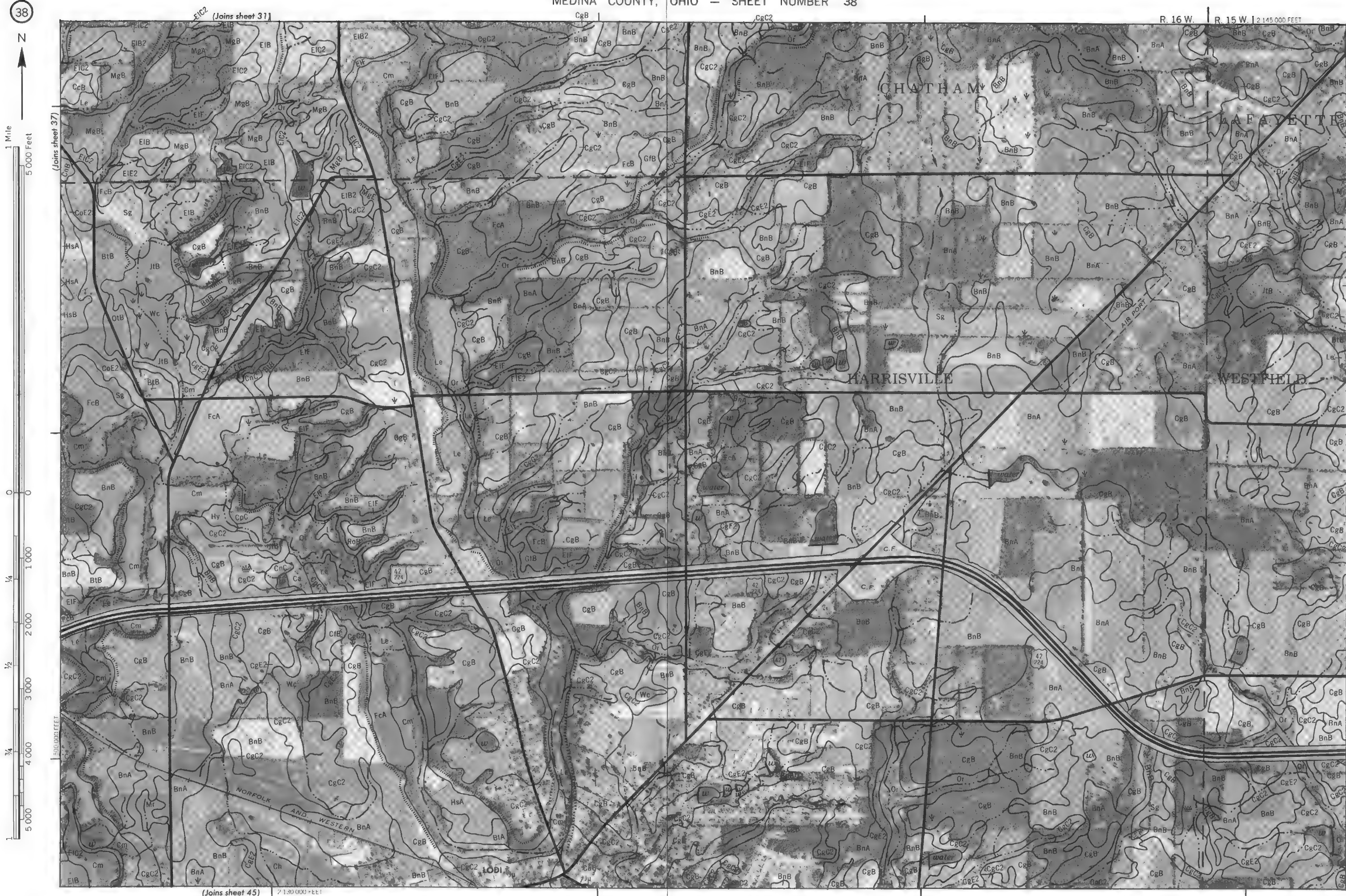

N
(Joins sheet 27)
R. 14 W.
R. 13 W.
T. 2 N.
(Joins sheet 33)
(Joins sheet 35)
(Joins sheet 41)
MONTVILLE
SHARON
ROCKY RIVER
WEST BRANCH
AKRON CANTON AND YOUNGSTOWN
water
1 Mile
5 000 Feet
2 190 000 FEET
2 200 000 FEET

MEDINA COUNTY, OHIO NO. 35

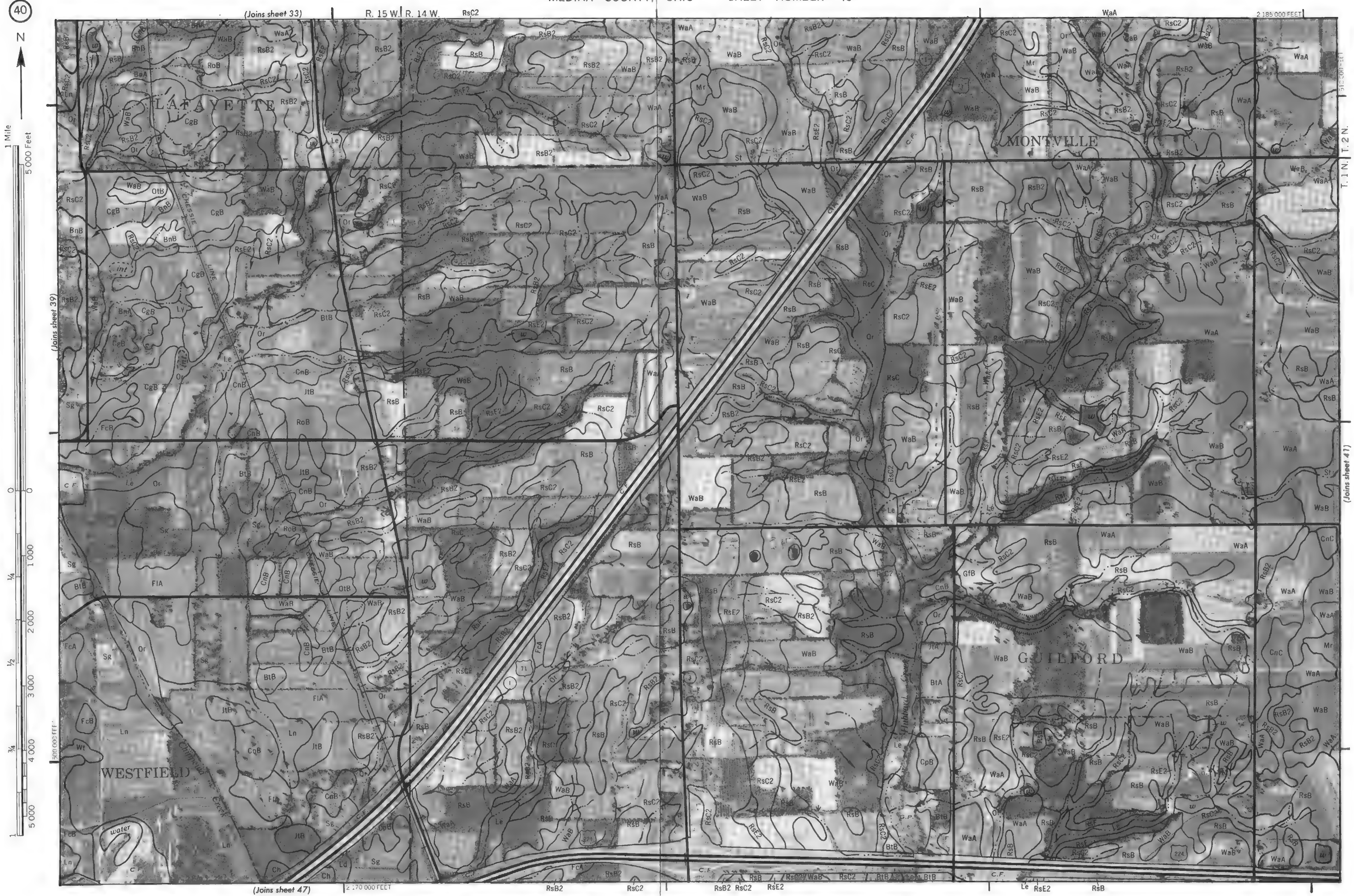

36
N
1 Mile
5 000 Feet
0
1 000
2 000
3 000
4 000
5 000
¼
½
¾
R. 16 W.
R. 17 W.
(Joins sheet 29)
(Joins sheet 43)
(Joins sheet 37)
2 105 000 FEET
2 090 000 FEET
510 000 FEET
T. 2 N.
T. 1 N.
LORAIN COUNTY
ASHLAND COUNTY
SPENCER
HOMER
CHESSIE LINE
301
MEDINA COUNTY, OHIO NO. 36



37
N
SPENCER
CHATHAM
HOMER
HARRISVILLE
EAST BRANCH
BLACK RIVER
R. 17 W.
R. 16 W.
T. 2 N.
T. 1 N.
(Joins sheet 30)
(Joins sheet 38)
(Joins sheet 44)
(Joins sheet 36)
1 Mile
5 000 Feet
MEDINA COUNTY, OHIO NO. 37


38
N
1 Mile
5 000 Feet
(Joins sheet 31)
(Joins sheet 37)
(Joins sheet 39)
(Joins sheet 45)
R. 16 W.
R. 15 W.
2 145 000 FEET
2 130 000 FEET
T. 2 N.
T. 1 N.
CHATHAM
LAFAYETTE
HARRISVILLE
WESTFIELD
LODI
AIRPORT
NORFOLK AND WESTERN

MEDINA COUNTY, OHIO NO. 39

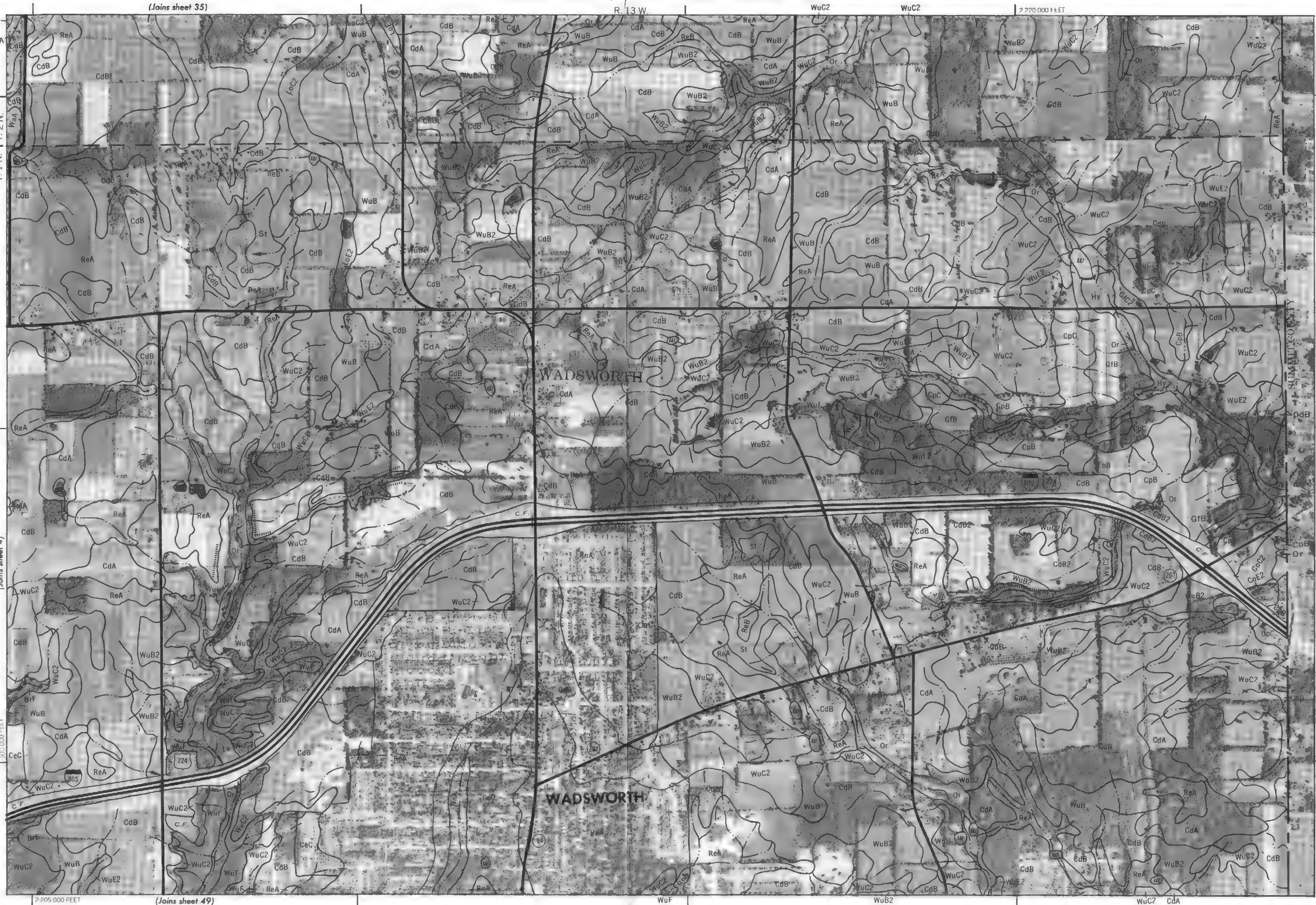


MEDINA COUNTY, OHIO NO. 40

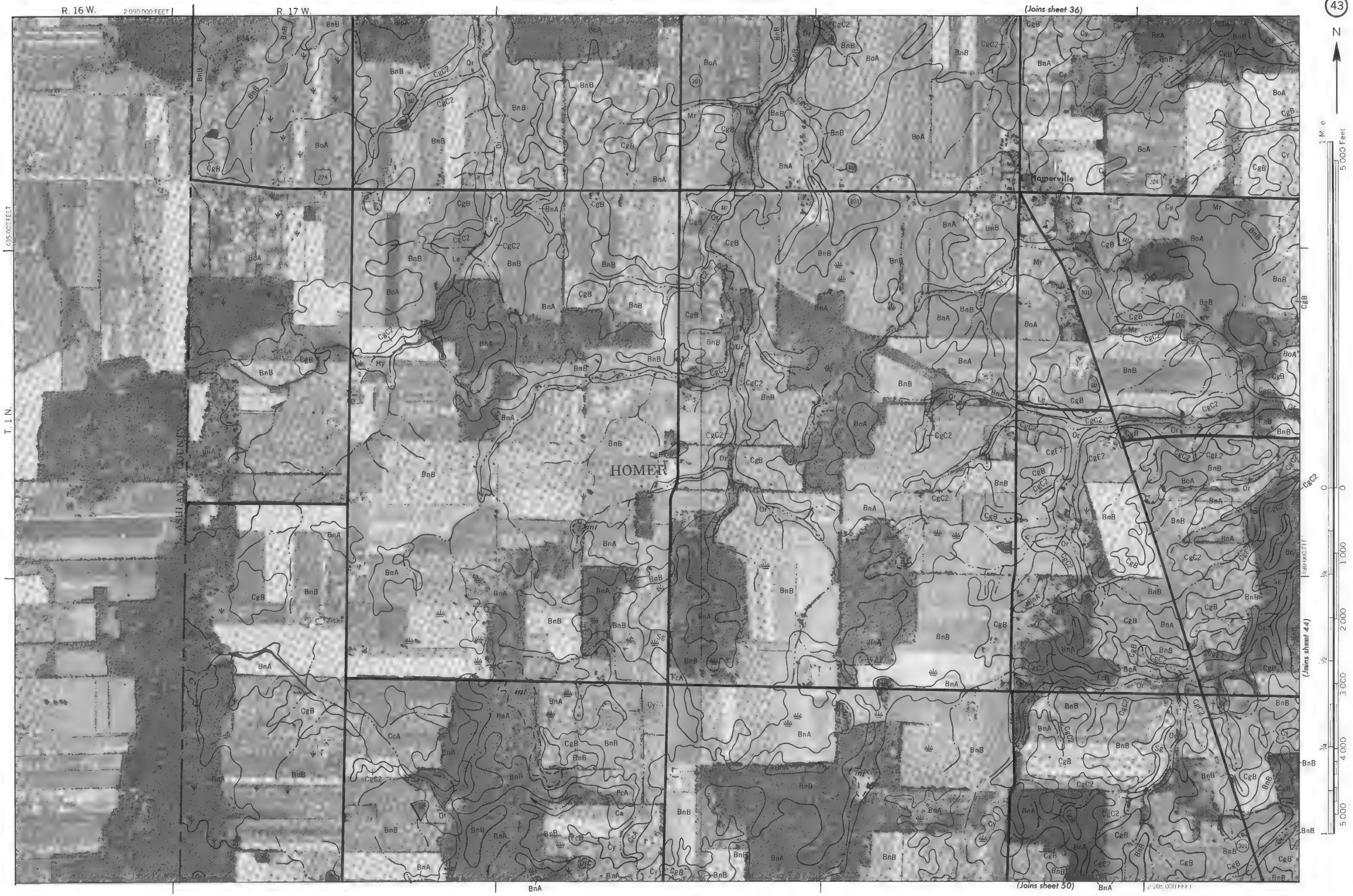
MEDINA COUNTY, OHIO NO. 41

This map is compiled on 197[illegible] aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

MEDINA COUNTY, OHIO — SHEET NUMBER 42



MEDINA COUNTY, OHIO NO. 42


43
N
R. 16 W.
R. 17 W.
(Joins sheet 36)
T. 1 N.
ASHLAND COUNTY
HOMER
Homerville
(Joins sheet 44)
(Joins sheet 50)
1 Mile
5 000 Feet


44
N
(Joins sheet 37)
(Joins sheet 43)
(Joins sheet 45)
(Joins sheet 51)
R. 17 W.
R. 16 W.
T. 1 N.
HOMER
HARRISVILLE
RAILROAD
5 000 Feet
Mile
0
1/4
1/2
3/4
1
1 000
2 000
3 000
4 000
5 000

(45)

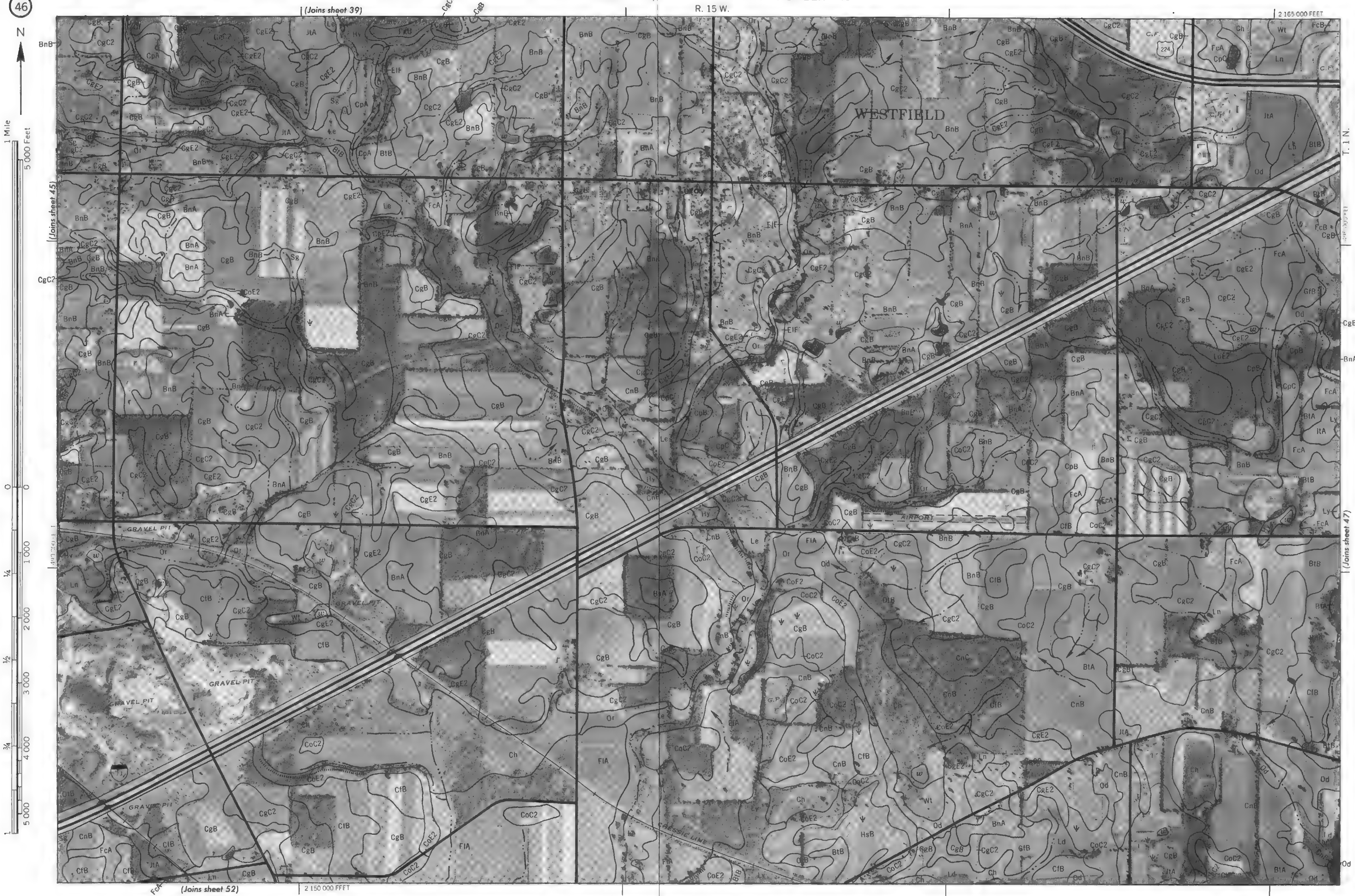
(Joins sheet 38)

R. 16 W. R. 15 W.

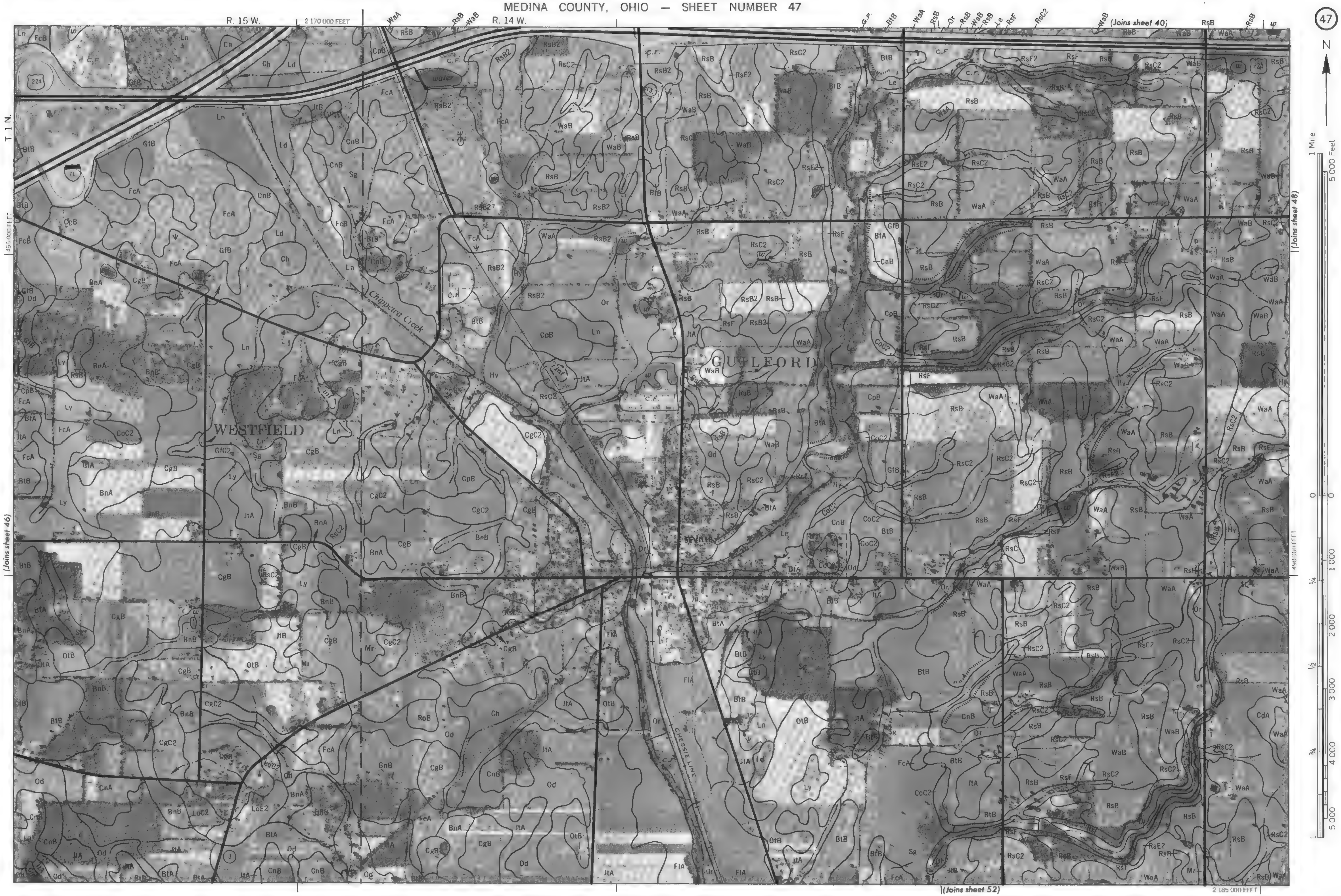
(Joins sheet 51)

MEDINA COUNTY, OHIO NO. 45

MEDINA COUNTY, OHIO — SHEET NUMBER 46

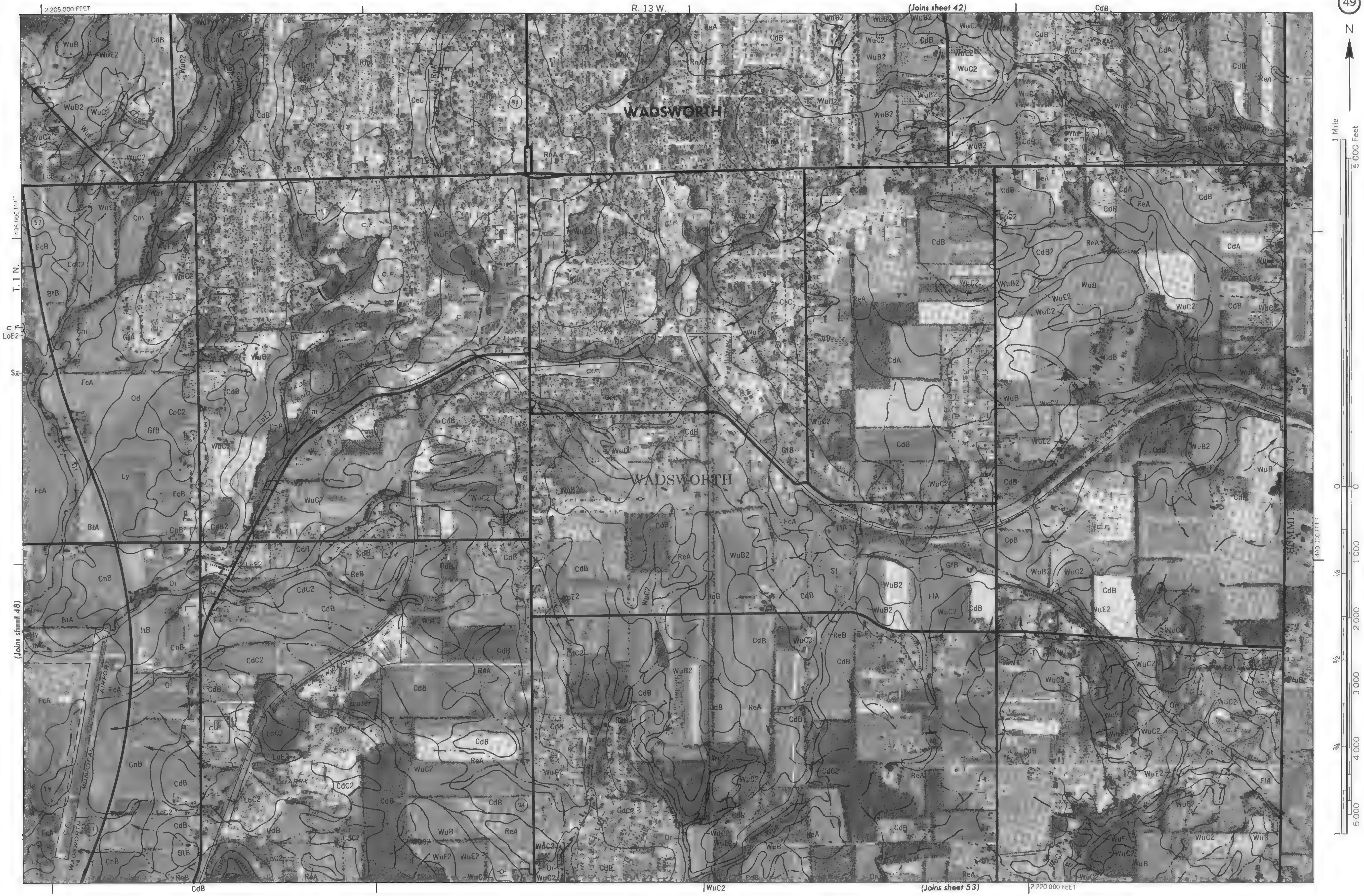


MEDINA COUNTY, OHIO NO. 46



MEDINA COUNTY, OHIO NO. 47

MEDINA COUNTY, OHIO NO. 48


2 205 000 FEET
R. 13 W.
(Joins sheet 42)
T. 1 N.
WADSWORTH
(Joins sheet 48)
(Joins sheet 53)
2 220 000 FEET
SUMMIT COUNTY
WADSWORTH MUNICIPAL AIRPORT
water
N
1 Mile
5 000 Feet
0
1000
2000
3000
4000
5000
¼
½
¾
1
CdB
WuC2
WuB2
ReA
CdA
WuB
WuE2
FcA
FcB
BtA
BtB
CnB
Ly
Od
GfB
CdC2
LoC2
Sg
Cm
St
FlA
Or

(50)

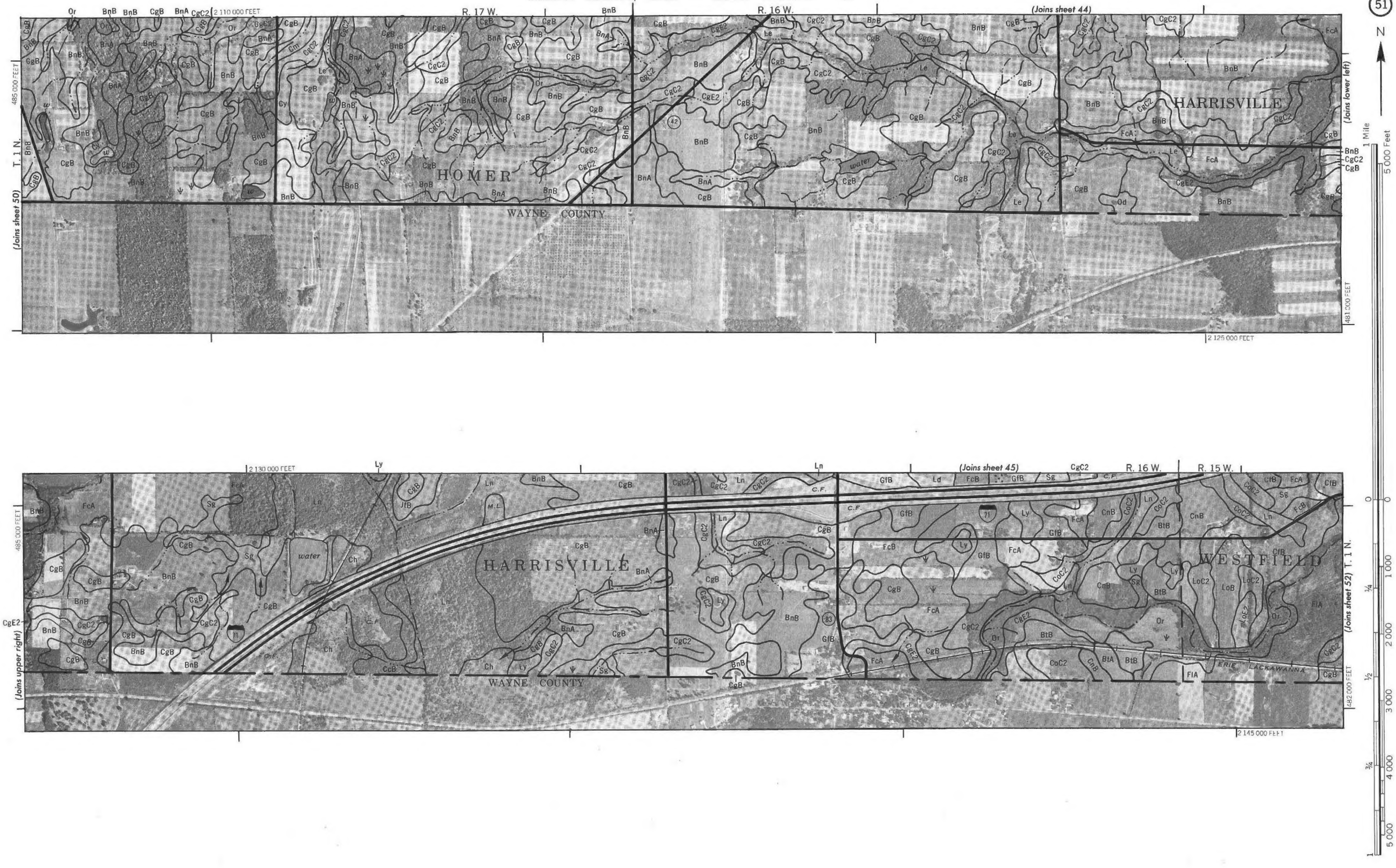
N

1 Mile
5 000 Feet
0
1 000
¼
2 000
½
3 000
¾
4 000
5 000
1
5 000

This map is compiled on 1973 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

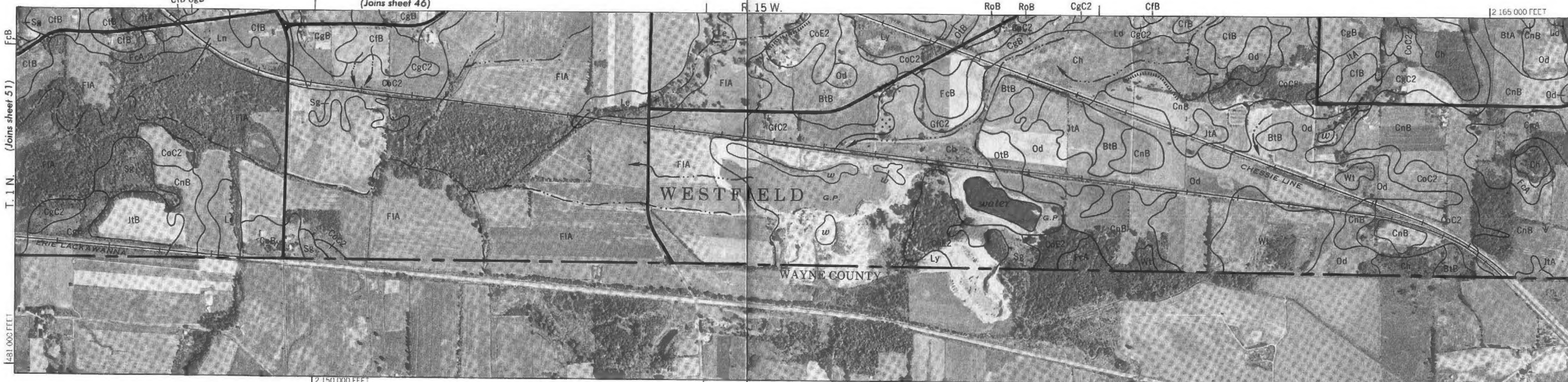
MEDINA COUNTY, OHIO NO. 50

51



MEDINA COUNTY, OHIO NO. 51

...s map is compiled on 1973 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



4 000 AND 5 000-FOOT GRID TICKS

This map is compiled on 1973 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

MEDINA COUNTY, OHIO NO. 52

53

MEDINA COUNTY, OHIO NO. 53

This map is compiled on 1973 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.